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CHAPTERS ON MACHINERY AND LABOR

I. THE INTRODUCTION OF SEMI-AUTOMATIC  
BOTTLE MACHINES

SUMMARY

Stages in the introduction of machinery for the manufacture of glass bottles, 337. — I. The technical character of the semi-automatic machine, 339. — II. The rate of introduction, 341. — The potential displacement involved, 341. — The actual displacement, 342. — III. The jurisdiction of the unions concerned, 344. — The opposition of the Flint Glass Workers to the introduction of the machine, 345. — The jurisdictional conflict between the Glass Bottle Blowers and the Flint Glass Workers, 348. — IV. The machine policy of the Glass Bottle Blowers, 351. — V. Effect of the machine on wages and hours of labor, 353. — Estimate of the validity of the policy of the Glass Bottle Blowers, 356.

THE art of blowing glass into the form of jars and bottles is one of the oldest of existing crafts; it antedates by centuries the art of printing from movable type and is coeval with the smelting of iron. The manufacture of bottles and jars by the ancient method — hand blowing — is carried on by working units known as "shops." In each of these there are seven persons — three skilled workmen and four boys. Two of the men blow and the third finishes. The blower takes a lump of glass from the pot or tank on his pipe, rolls and partially blows it. The mold tender, a boy, opens an iron mold

and the blower lowers the glass into the mold. The mold having been closed, the blower inflates the glass to fill the mold. The pipe is cracked off from the bottle or jar, which is then carried by another boy — known as the “snapping-up boy” — to the finisher, who shapes with tools the neck and lip of the bottle. A third boy — the “carrying-in boy” — carries the ware to the annealing *lehr*. A “cleaning-off boy” cleans the blow pipes of the blowers in preparation for re-use. Variations in this arrangement are found. In making some kinds of bottles, for example, a gathering boy gathers the glass for the blower, but the rules of the union have severely restricted this form of the division of labor except on very heavy ware.

Since 1898 the manufacture of bottles and jars has been revolutionized by the introduction of machinery, but the change from the older hand technique has been accomplished by a series of innovations. In most other trades in which machinery has displaced handicraft, the original machine has been improved upon, but the improvements have not radically changed its character. In the manufacture of glass bottles, on the contrary, the struggle between craftsman and machine has been complicated by a struggle of machine against machine. The machines successively introduced for the manufacture of glass bottles differ from each other not only in their technical character, but also in the two particulars most important in any study of the introduction of machinery — the degree to which the machine displaces hand labor, and the extent to which skilled labor is required for its operation.

The history of the introduction of machinery for the manufacture of bottles consequently falls into three periods, each of which is characterized by the introduction of a new form of machine:

1. From 1898 to 1905, semi-automatic machines, requiring for their effective working skilled workmen, largely displaced hand blowers in the manufacture of wide-mouth ware.

2. From 1905 to 1917, the Owens automatic machine, which required only supervision and the amount of whose product was independent of the speed of the watcher, was the chief factor in the displacement of hand blowers and of the skilled operatives of semi-automatic machines. Contemporaneous with the introduction of the Owens was the appearance of semi-automatic machines for making narrow-mouth ware.

3. From 1917 to 1924, the trade has again been revolutionized by the introduction of "feed and flow devices" which, while requiring more attention than the Owens machine, produce more ware than the semi-automatics. The attendants, moreover, need not be skilled workers, altho the question of the relative superiority of skilled and unskilled workmen as attendants is still in dispute.

The present paper deals with only the first of these periods — the one characterized by the introduction of semi-automatic machines for manufacturing wide-mouth ware.

## I

The fundamental principle in all semi-automatic machines for making bottles and jars is the combination of pressing and blowing. These two methods were first united as a means of fashioning large pieces of table ware. In 1865 Gillinder, for example, patented a method of making glass pitchers by first pressing and then blowing. The blowing, however, was not in a mold, but served merely to hold the article distended while it was shaped by tools. Also, in 1873 Atterbury patented

a process by which a lump of glass was pressed to form the top of an article, the bottom of the pressing mold was then dropped, and the glass was expanded by blowing into the shape of the blowing mold. Gillinder's method was used to some extent, but apparently Atterbury's device was never used commercially. In 1881 Philip Arbogast patented a combined pressing and blowing device, in which the top of the article was first pressed; the article was then removed to a blowing mold and by means of mechanically-applied air pressure expanded to the shape of the mold. In 1884 Mr. D. C. Ripley, of Pittsburgh, a manufacturer of table ware, began to use the Arbogast machine, and in 1885 purchased the patent rights. The Arbogast method was used by Mr. Ripley in manufacturing certain kinds of table ware, and large containers such as druggists' jars.

The Arbogast machine, however, was used to a very limited extent and hardly at all on ordinary jars and bottles until 1893, when the Enterprise Glass Company secured the right to use the machine and commenced to make vaseline jars. Licenses were issued to several other manufacturers, and considerable quantities of "packers' goods" were made, that is, jars and wide-mouth bottles for liquids and pastes. Improvements were soon made on the original machines. The most important of these was the development of a combined pressing and blowing mold, by which the need for the removal of the article from the press mold was obviated. By 1896 the first of the new machines was in successful operation at the Atlas Glass Works, Washington, Pennsylvania, and in 1898 similar machines were installed by Ball Brothers, the largest manufacturer of fruit jars. Each machine required two operators. One, known as the "gatherer," gathered the glass from the tank; another, the "presser," cut off the glass and managed the

lever which controlled the plunger and the air pressure. From this time, the use of the machine rapidly widened. By 1905 a great variety of wide-mouth ware — fruit jars, ink bottles, vaseline jars, milk jars—was being made on the machine.

## II

It is impossible to give more than a rough estimate of the number of the machines in use by years, but the following table is approximately correct:

NUMBER OF SEMI-AUTOMATIC MACHINES IN USE, 1897-1905

1897..... 20	1900..... 80	1903..... 150
1898..... 50	1901..... 90	1904..... 200
1899..... 60	1902..... 100	1905..... 250 <sup>1</sup>

A measure of the amount of possible displacement of hand blowers involved in the introduction of the semi-automatic machines may be had by assuming that the relative production by hand and by machine on all wide-mouth ware was the same as that in the manufacture of fruit jars, where the facts as to the amount of displacement have been recorded.<sup>2</sup> Three hand blowers working as a "shop" had been able to make 3600 quart fruit jars in a day. One presser and one gatherer operating a machine could make in a day 4300 quart jars, or considerably more than three blowers. Since the machines were ordinarily operated for two shifts, we may allow a displacement of six hand blowers for each machine. As the total number of machines in operation in 1905 was 250, we have a potential displacement of hand

1. Of the total number of machines in operation in 1905, 120 were in factories controlled by the Glass Bottle Blowers' Association, 75 in factories controlled by the Flint Glass Workers' Union, and the remainder in nonunion plants.

2. This assumption underestimates somewhat the capacity of the machines in terms of hand labor, since fruit jars were not finished by skilled blowers, but by handy-men. On other ware, such as milk jars, where one of the three men in the shop worked as finisher, the displacement due to the machine was greater than on fruit jars.

blowers of about 1500. That is, in 1905 an amount of work was being done on the machines which, if done by hand, would have required the work of 1500 hand blowers. Since the number of glass-bottle blowers in the United States in 1897 was probably not more than 6000, one fourth of them would have been thrown out of work if the potential displacement had been realized.

As a matter of fact, almost no displacement occurred. This result was due chiefly to the great increase in the production of glass jars and bottles during the period under discussion. The following table, taken from the Census of Manufactures, shows by classes the number of bottles produced in the years 1899 and 1904:

PRODUCTION OF BOTTLES AND JARS, 1899 AND 1904

	<i>(In gross)</i>		Per cent of Increase
	1899	1904	
Prescriptions, vials, and druggists' wares .....	2,423,932	3,202,586	32
Beer, soda, and mineral .....	1,351,118	2,351,852	73
Liquors and flasks .....	985,374	2,157,801	119
Milk jars .....	146,142	253,651	73
Fruit jars .....	789,298	1,061,289	34
Patent and proprietary .....	1,296,131	1,657,372	29
Packers and preservers .....	784,588	1,237,065	57

The greater part of this increase — amounting in the aggregate to nearly 50 per cent — was entirely independent of the introduction of the machine. Of the seven classes of ware enumerated, the machine was used only on milk jars, fruit jars, and packers' goods. The increase in the production of these classes of goods was far less than sufficient to offset the displacement due to the machine, even if all the men employed on the machines had been former hand blowers. The demand for bottles was not stimulated by the lower price sufficiently to compensate for the economy in labor. The elasticity of demand for glass bottles appears to be very small.

The cost of the glass container for most products is only a small part of the total cost, and a reduction in the price of the container therefore stimulates very little the demand for the article. Also, the extent to which glass is substituted as a container for tin or paper appears to be dependent more on slow changes in taste than on cost. During the period under discussion there was some extension in the use of wide-mouth bottles as containers. Candies, meats, and tobacco, for example, in 1905 were being sold in glass packages. The superiority of the machine-made product in finish and in uniformity of content also increased somewhat the sale of containers.<sup>3</sup> But in the main the great extension in the use of bottles and jars from 1899 to 1904 was due either to an increase in the consumption of the article, in no way affected by a change in the price of the container, as was the case with beer bottles, or to changes in taste which demanded glass-packed goods for sanitary reasons.

The potential displacement of hand blowers from the trade was met in two ways: (1) by the conversion of jar blowers into blowers of other forms of ware unaffected by the machine, (2) by placing hand blowers in positions as machine workers. The first of these methods was practicable because of the great increase in the production of glass bottles. From 1897 to 1905, the number of hand bottle blowers in the United States increased from six thousand to nine thousand. Unfortunately, there were some classes of blowers so highly specialized that it was impossible to convert them. Many blowers of fruit jars, for example, could not readily become blowers of beer bottles.<sup>4</sup> Moreover, where the factory was devoted

3. In 1897, the prices for machine-made fruit jars was higher than that for hand-made jars. *Proceedings, Glass Bottle Blowers' Association*, 1898, p. 56.

4. Testimony of D. A. Hayes, in *Report of Industrial Commission*, vol. vii, p. 111.

entirely to the production of a single line of ware, and that line of ware was taken over by the machine, it was necessary for a workman to move to some other factory if he was to continue as a hand blower.

The second method of avoiding displacement — the conversion of hand blowers into machine workers — was far less important as a device for reducing displacement from the trade. This was due partly to the disinclination of blowers to take places on the machine, partly to the reluctance of the employers to employ hand blowers as machine workers, but chiefly to an unfortunate struggle between the two unions in the trade.

### III

Until 1913 the jurisdiction over the jar and bottle trade was divided between two unions, the Flint Glass Workers and the Glass Bottle Blowers. The original line of demarcation between the unions was based on the difference in the kind of glass used. The Flint Glass Workers worked with flint glass, made in covered pots, while the Green Glass Workers -- as the present union of Glass Bottle Blowers was known for many years -- used green glass, made in open pots. The price for making articles from open pots was less than the price charged for making articles from covered pots. Consequently, most kinds of jars and bottles were made from green glass. Only the higher grades of bottles, such as prescription bottles, were made from flint glass. Moreover, in making articles by pressing, flint glass was almost always used. The result was that the Green Glass Workers were confined to blowing bottles and jars, while the Flint Glass Workers had branches of pressers as well as of blowers.

With the introduction of the tank, in the nineties, the line of division between the trades became blurred, since

flint glass of good quality can be made in the tank. As the list price of the Green Glass Workers was lower than that of the Flints for similar articles, the bottles formerly made by the Flints rapidly came to be made in factories controlled by the Green Glass Workers. In 1895, this change was signalized by a change in the name of the United Green Glass Workers' Association to the Glass Bottle Blowers' Association. In 1900, the prescription branch of the Flints — blowers of prescription bottles — against the wishes of that organization, went over bodily to the Glass Bottle Blowers. At the time the machine was introduced, therefore, the relations between the Flints and the Bottle Blowers were already much strained.

The machine was first used, as has already been noted, in making flint glass ware, such as table ware and globe jars. Its use in making small packers' jars was begun experimentally in 1891, but was discontinued because the Flint Glass Workers, who controlled the Ripley factory, insisted that the "move" — the amount which might be made by a workman in a half-day — should be fixed.<sup>5</sup> At that time, there was no move in the prescription department, but there was in the pressed-ware department. Since the articles in question were partly made by pressing, the president of the Flints held that the number to be made must be limited, and that the limit was to be in accordance with the amount or-

5. In his testimony in the case of the United States Glass Company *vs.* Atlas Glass Company, Mr. Ripley said, "The policy of the labor organization has been that no device that lessened the amount of skill would be operated except for the same amount of money as was paid for the full exercise of skill in the manufacture of the article by new processes. Also any new device which enabled the workmen to make more with less labor could not be used to advantage from the fact that the numbers were limited to the number determined by the labor organization." (Defendant's Brief in United States Glass Company *vs.* Atlas Glass Company, p. 85.)

dinarily made in the prescription branch of similar articles by blowing.<sup>6</sup> The net result of this ruling was that the machine labor cost was to be identical with the cost of hand manufacture.

Mr. Ripley then ceased the manufacture of machine-made jars in his own factory and licensed a number of other manufacturers to use the machine on packers' goods. The factories which thus began work with the machine were all nonunion.<sup>7</sup> In 1895, the president of the Flints called attention to the increasing use of the machine, and discussed the proper policy of the union. He was now convinced that the machine should be worked by the members of the union. "By working it and finding it successful," he said, "we could minimize its dangers by buying from the owner . . . or we could so arrange the prices for working it as to leave it little or no advantage and thus avoid placing our association in the position of opposing useful machinery."<sup>8</sup>

In 1896, one of the largest union glass factories in the country requested the Flints to make a wage-list for pressed-and-blown bottles, and asserted that the class of work made on the machine was being rapidly taken from

6. Proceedings, Flint Glass Workers' Union, 1893, p. 19. President Smith said: "Within the past few months a dark cloud has arisen in the horizon of the Prescription Department. We refer to the machine for making bottles by the dual process of pressing and blowing. The machine was brought to our notice by reason of a dispute over the number that should constitute a move of the 2 oz. and wages therefor. It appears that a shop made about 900 for one half-day's work. The firm demanded 1200. We advised a move on the basis of the Prescription List. This, of course, was not satisfactory to Mr. Ripley. Under favorable conditions it is no exaggeration to say that a shop can produce four thousand 2 oz. bottles in a day's work." At the same convention, Vice-President Hinckley said: "What we want is to put the cost of production equal on the machine-and hand-made article." (Ibid., p. 48.)

7. In his testimony in the case of the United States Glass Company vs. the Atlas Glass Company, Mr. Ripley said, "In all cases where we have granted licenses it has been necessary that the parties operating the device first rid themselves of the domination of the union."

8. Proceedings, Flint Glass Workers 1895, p. 61.

union houses, partly on account of the superiority of the machine product. A price-list for machine-made bottles, accordingly, was approved by the convention.<sup>9</sup> Apparently, however, very few union gatherers or pressers were employed on the machines until they were introduced into the factory of Ball Brothers. This firm was employing at the time several hundred members of the Glass Bottle Blowers' Union and the machine was intended to take over at once a part of, and ultimately all, the work of these hand blowers.

When the machines were started at Ball Brothers factory, the Blowers had no policy with reference to the introduction of machinery. It is true there was a rule dating from 1892 among the by-laws of the association, which prohibited any member from "using Ashley's bottle-blowing machine or any other bottle-blowing machine"; but this was not seriously regarded. The convention of 1898, after discussing the introduction of the machine in the fruit-jar houses, had decided to leave the matter in the hands of the president and executive board "to make the best settlement and upon the most advantageous terms that they can get."<sup>1</sup> The president and executive board, so far from refusing permission to members to operate machines, urged insistently that the displaced blowers should be employed on the machines. Ball Brothers were reluctant to accede to this request. In the first place, they wished to put skilled pressers on the machines; in the second place, they distrusted the good will of the displaced blowers toward the machine. Moved by these considerations

9. Proceedings, Flint Glass Workers, 1896, pp. 145, 203, 240. The rates for gatherers in press houses were to be from \$1.47 to \$1.54 per turn. In prescription houses 8-oz. bottles were to be made at the rate of 28½ cents per gross, of which 16½ cents was to go to the presser and 11½ cents to the gatherer.

1. Proceedings, Glass Bottle Blowers, 1898, p. 75.

they manned their first machines with pressers who were members of the Flint Glass Workers' Union.<sup>2</sup> Later in the year, however, they gave places on additional machines to members of the association. For a considerable period some of their tanks were worked by Flints and some by Blowers.

From 1898 to 1913, when a jurisdictional agreement between the Bottle Blowers and the Flints was concluded, the two unions were engaged in a constant struggle over control of the machines. The Flints contended that the work belonged to them, since they had jurisdiction over pressing. The Bottle Blowers on their side maintained that jurisdiction belonged to them, since the machines made bottles and displaced bottle blowers.

Two things favored the Blowers. In the first place, it was obvious that if blowers could be taught to do the required work, a considerable amount of displacement might be obviated. The Blowers, therefore, were under strong inducement to secure control of the machines. Secondly, since the machines were in most cases introduced in bottle houses and since the kinds of bottles they could make were limited, the employers were reluctant to break with the association and perhaps lose their force of hand blowers. The Blowers finally succeeded in establishing their jurisdiction over the machines, but the conflict of the two unions was not conducive to strength in dealing with the machine question and employers not infrequently extorted concessions by pitting one union against the other.

At first an arrangement was made that a member of one union working in a factory under the jurisdiction of the other union should retain his membership in his own union, but pay the trade assessment of the union under whose jurisdiction he was working. In 1900, the Blowers

2. Proceedings, Glass Bottle Blowers, 1898, p. 12.

proposed that Flints working in association factories should become members of the association, and *vice versa*, but the Flints refused to accept the proposal. In his annual report for 1901 the president of the Flints declared that this proposal was designed to secure the control of the machines to the Blowers, and contended that the Blowers could not furnish competent gatherers and pressers from their own members, and wished to use the Flint workmen to satisfy employers until the Blowers could train gatherers and pressers from their own number.<sup>3</sup> The Flint convention of 1901 accordingly forbade its members who were working on machines to pay assessments to the Blowers. At Olean, New York, in March, 1902, when the Flint gatherers and pressers refused to pay, they were replaced by workmen taken, as alleged by the Flints, from nonunion plants.<sup>4</sup> In 1902, the convention of the Blowers definitely decided that all machines in association factories should be operated by members of the Blowers' union.<sup>5</sup>

The Flints made reprisals wherever possible. The difficulty which they faced, however, was that the Blowers controlled the supply of skilled hand blowers and the Flints could not furnish the required blowers to the bottle houses. It was evident that, unless some method could be devised for securing blowers, the association would entirely control the machines. The work of a bottle machine presser differs somewhat from that of the presser in ordinary press houses, and the manufacturers who were installing machines naturally turned to the union with which they were already in relations and which controlled the majority of machine pressers.

Under these circumstances the Flints cast about for

3. Proceedings, Flint Glass Workers, 1901, p. 60.

4. Proceedings, Flint Glass Workers, 1902, pp. 55, 56.

5. Proceedings, Glass Bottle Blowers, 1902, p. 110.

some means of getting blowers. By a remarkable coincidence they found a source ready to hand. For many years, the prescription department of the Flints had suffered severely from the competition of nonunion houses making whiskey flasks. In 1899, the union decided that it would be cheaper to erect a factory and make flasks even at a very low price than it would be to attempt to force the flask houses into the union by strikes. The union hoped that when the nonunion houses found that the price was unprofitable they would unionize their plants. Accordingly, a factory was equipped for making flasks at Summitville, Indiana. After the prescription department went over to the association, in 1900, the Flints no longer had any incentive to use the plant for its original purpose. It was decided to continue the operation of the plant with the purpose of training up blowers to supply manufacturers who were willing to use Flint semi-automatic machine workers. In 1903, the president of the Flints said, "We have demonstrated our ability to make bottle blowers, and should make them in Summitville as fast as it is necessary to use them to protect our members from being compelled to join the Greens or lose their job. The Summitville factory is our powerful weapon of defence."<sup>6</sup> In June, 1903, in a controversy with the association over a machine factory, the president of the Flints offered to supply the manager with bottle blowers if the association struck the plant on account of the refusal of the Flint machine pressers to pay dues to the association.<sup>7</sup> A few days later the Summitville factory was burned and a plan for the erection of a new factory was rejected by the union.<sup>8</sup>

6. Proceedings, Flint Glass Workers, 1903, p. 146; Journal Flint Glass Workers, November, 1912, p. 211; National Glass Budget, July 11, 1903.

7. Proceedings, Flint Glass Workers, 1903, p. 139.

8. Ibid., pp. 286, 296.

The Blowers retaliated by invading branches of work belonging to the Flints. In 1904, they secured jurisdiction over the plant of the Illinois Glass Company at Alton, Illinois, and took into membership not only seventy-five Flint machine workers, but a certain number of iron-mold workers and caster-place workers, branches of the glass trade over which the Flints had jurisdiction.<sup>9</sup> The constant warfare greatly impeded both the Blowers and the Flints in attempts to improve the working conditions of the machine workers. By 1905, however, the issue was fairly well decided in favor of the Blowers.

#### IV

The Blowers' policy with reference to the new machines was confined at the outset entirely to securing control of the machine in order to make it possible to transfer hand blowers to machine work. Even so, the outlook was discouraging. The machines had been worked hitherto almost exclusively in nonunion plants. The work on the machine was admittedly of a kind for which hand blowers would need a period of training. The union hoped that the general knowledge of the glass trade possessed by the hand blowers would enable them expeditiously to master the technique of the machine, but employers were inclined to be skeptical. To force the employment of displaced hand blowers on the machine, the union had only one weapon against employers — the threat to withdraw their hand blowers. But as things stood in 1898 the union could not afford to place much reliance on this resource of enforcement, as there were too many blowers beyond the control of the association. The prescription department of the Flints had not been absorbed, and nonunion glass-bottle blowers

9. Proceedings, Flint Glass Workers, 1905, pp. 74, 76.

were numerous. At a conference with Ball Brothers in February, 1897, President Hayes "informed them that the association would not interfere with them in the introduction of jar-making machinery but would expect them to employ union labor and also request them to give our men the preference; provided, of course, they proved themselves capable of operating the machines after gaining some knowledge of them."<sup>1</sup> The Blowers in 1898, however, as has been noted, allowed the firm to man its new machines with Flint pressers and gatherers, contenting itself with the promise that the firm would later employ Blowers on part of its machines. In September, 1898, some ninety members of the Blowers' union went to work on the machines.

The rules adopted for recruiting machine workmen were not well suited, on their face, to securing the conversion of blowers into machine operators. The work of operating the machines was recognized as a separate department in the trade, with its own rules. The learner in the machine department began as a gatherer. For one year, he worked at 10 per cent less than the journeyman gatherer's wage. At the end of the year he became a member of the association and a journeyman gatherer. A journeyman gatherer had to work three years before he was entitled to press, and meanwhile his wage was 75 per cent of that of a presser. If these rules had been strictly enforced against hand blowers, the process of conversion obviously would have been a rigorous one — equivalent indeed to learning a new trade. But the rules were not applied against journeymen hand blowers, who were allowed to become full-fledged gatherers, or even pressers, whenever employers were willing to hire them. In an expanding trade it would have been quite possible for numbers of hand blowers to become

1. Proceedings, Glass Bottle Blowers, 1897, p. 34.

pressers. As a matter of fact comparatively few in this period made the step. The blowers of wide-mouth ware preferred for the most part to go over to other branches of the trade, where work was abundant. Indeed, the problem of furnishing workmen to man the new machines was often perplexing to the officers of the union.

One other policy was strongly urged on the union — the reduction of the hand list for ware manufactured on the machine also. In 1896, the manufacturers asked, at the annual wage conference, that the hand price for fruit jars be reduced 25 per cent as a means of meeting machine competition. The Blowers refused. In 1898, after the machines had been widely introduced in fruit-jar factories, the officers of the union agreed to reduce the price for making ordinary fruit jars by hand 45 per cent. This was done, however, only after one of the leading manufacturers of fruit jars had started one of his plants with nonunion men.<sup>2</sup> Despite the reduction, machines were introduced the next year in the plant of this manufacturer. After this experience the union steadily refused, during the period under discussion, to reduce the hand list on other ware in order to meet the competition of machine ware.

## V

There remains to be considered the effect of the narrow-mouth semi-automatic, on the wages, hours, and other working conditions of the workers. Unfortunately, no exact statistical material is available, since the Bureau of Labor Statistics has not included bottle blowing among the industries covered by its wage studies. Since the Bottle Blowers are piece-workers, readjustment of working conditions frequently affects earnings

2. Proceedings, Glass Bottle Blowers, 1899, p. 12.

as much as changes in the piece rates, and these readjustments are not recorded.<sup>3</sup>

In 1898, when the semi-automatic was introduced, the hand blowers were working at a discount of 15 per cent from their standard hand list. By two increases made in 1899 and 1900 they again reached the level of the net list, and maintained this scale during the period under consideration. The standard working day for hand blowers at the time of the introduction of the semi-automatic machine was eight and one-half hours' actual working time. Glass factories for the most part worked two shifts and the men on the night shift alternated weekly with the men on the day shift. The week's work terminated at 3 A.M. on Sunday morning, and began again on Monday at 7 A.M. In 1898, the union secured from the manufacturers the abolition of the Saturday night shift, thus reducing the working week to eleven shifts. In 1903, the union tried to secure the cessation of work at twelve o'clock on Saturdays, and was able to obtain an agreement to stop at four o'clock, a net reduction of forty-five minutes in the weekly hours of work.<sup>4</sup> In general, it may be safely said that neither the standard rate nor the length of the working day of hand blowers was adversely affected by the introduction of the semi-automatic. So rapidly was the demand for glass bottles increasing that throughout the period a constant scarcity of hand blowers manifested itself.

Much less favorable were the conditions of those hand blowers who, from one cause or another, were forced to

3. In 1900, when the restoration of the net list was under consideration, the employers submitted detailed wage statistics which showed that the average daily earnings of the blowers in 1899-1900 at the reduced list price were \$5.46, while in the year 1894, before prices for blowing were reduced, the average was \$4.94. (Proceedings, Glass Bottle Blowers, 1900, pp. 48, 49.)

4. Minutes of the Final Conference, 1903, p. 24. The hour of quitting was made four o'clock instead of five, but the workers conceded the afternoon "tempo" or pause of fifteen minutes.

become machine operators. The machine piece rate for fruit jars — the basic rate for all semi-automatic machine rates — established in 1898, was the rate then being paid in nonunion machine plants.<sup>5</sup> This rate was accepted by the Flints and later by the Blowers. Doubtless, if the situation had been different, a higher rate might have been obtained. The rivalry between the unions and the existence of a large body of nonunion machine workers precluded any effective action for a higher rate. At the outset the earnings of blowers who went on the machines was probably not more than half their old earnings. But the output increased rapidly with improvements in the machines and with the increasing adaptation of the men to the machines. The piece rate was increased in 1903, and by 1905 the average wage of skilled machine men was as high as the average for hand blowers. The nine-hour day originally agreed upon in 1898 remained in force in 1905.

That the union was not affected adversely by the introduction of the semi-automatic machine is clearly indicated by the increasing control exercised over the trade. In 1896, Mr. Denis Hayes, then vice-president of the union, in charge of the organization of nonunionists, made a careful census of union and nonunion bottle blowers. He found in all 6029 bottle blowers, of whom 4200 were in the unions and 2029 were nonunionists. In 1907, a similar census was taken with the result that of 10,997 skilled workers, including machine operators, 9627 were found to be in the union. The menace of nonunion competition, which in 1897 had been the chief concern of the Bottle Blowers, had almost ceased to exist by 1907.

The virtue of the Blowers' policy was not so much that it reduced the displacement caused by the wide-

5. Proceedings, Glass Bottle Blowers, 1898, p. 11.

mouth semi-automatic machine — altho even in this respect something was gained — as that it established a rule under which future displacement might be avoided. It was reasonable to anticipate in 1898 that future machine development would take the line of a gradual adaptation of semi-automatic machines to other lines of ware. By 1905, the Blowers had placed themselves in a position to cope with such a development. Unfortunately for the union, while the anticipated extension of the range of semi-automatic machinery did occur, the whole problem was complicated by the introduction of automatic machines. But even so, the policy of the union in establishing its control over semi-automatic machinery bore fruit in the form of some reduction in the amount of displacement.

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## A MOVING EQUILIBRIUM OF DEMAND AND SUPPLY

### SUMMARY

Elasticity of demand and flexibility of prices. — Relative cost of production and relative efficiency of organization, 359. — Laws of relative cost and relative return as contrasted with laws of cost and laws of return, 360. — Typical equations to the law of supply, 364. — The statistical derivation of the law of supply, 367. — A moving equilibrium of demand and supply, 368.

THE fundamental symmetry with which demand and supply coöperate in the determination of price suggests the possibility and indicates the desirability that the typical equation to the supply curve may be of the same general form as the equation to the curve of demand. In an earlier paper<sup>1</sup> I have shown that three types of equations to the law of demand may be derived from certain very simple hypotheses with regard to elasticity of demand. The definition of elasticity of demand is  $\eta = \frac{y}{x} \frac{dx}{dy}$ , where  $y$  = the price per unit of commodity, and  $x$  = the amount of commodity that is taken at price  $y$ . If  $\phi$ , the flexibility of prices, is defined as the reciprocal of  $\eta$ , then three types of equations of demand may be deduced by placing

$$\phi = a,$$

$$\phi = a + \beta x,$$

$$\phi = a + \beta x + \gamma x^2.$$

In the subsequent development of this paper we shall

1. "Elasticity of Demand and Flexibility of Prices," Journal of the American Statistical Society, March, 1922.

find that, in fact, the actual practice of business and the exigencies of economic theory concur in leading to the conclusion that the same typical equations reproduce the essential characteristics of both demand and supply.

The flexibility of prices  $\phi$ , or its reciprocal the elasticity of demand  $\eta$ , is a summary description of the equation of demand. The manner of its variation is all we need to know in order to solve most economic problems as far as their solution turns upon the law of demand. In the law of supply the analogue of  $\phi$  is  $\kappa$ , the coefficient of relative cost of production, which, we shall find, is a summary description of constant, increasing and diminishing relative cost. The empirical determination of  $\phi$  and  $\kappa$ , which will be exemplified in the sequel, makes possible the practical, concrete treatment of problems of demand and supply.

While  $\phi$  and  $\kappa$  epitomize the information that is employed in the solution of most questions relating to demand and supply, in some cases it is necessary to resort to other coefficients. Long ago Cournot gave criteria of laws of cost that lead to types of supply curves different from those that are derived by means of  $\kappa$ . If the total demand curve is treated in a manner similar to that in which Cournot treated the total cost curve, it is possible to obtain demand curves corresponding in type to the supply curves derived from the Cournot criteria of cost.

The traditional, statical theory of economic equilibrium acquires a new value in the light of these results. The concrete determination of the laws of supply and demand leads to the conception of a moving equilibrium of demand and supply, and this novel point of view will necessitate a revaluation and, I hope, a higher appreciation, of the problems and technique of statical equilibrium.

*Relative Cost of Production ( $\kappa$ ) and Relative Efficiency of  
Organization ( $\omega$ )*

Economic phenomena must be treated realistically, and a realistic treatment considers the phenomena in a state of flux. In consequence of the ceaseless changes in the conditions of business the representative entrepreneur is constantly asking, and constantly answering, the question whether he shall increase or diminish the amount of his physical output. His decisions are made from the point of view of the probable movement of demand, which lies beyond his control, and from the point of view of the efficiency of his own organization, which he is capable of modifying. This latter phase of the problem relates to supply, and the criterion upon which his decision is made should have a technical name. I propose to call it either the coefficient of relative cost of production ( $\kappa$ ), or the coefficient<sup>2</sup> of relative efficiency of organization ( $\omega$ ). The two quantities are related by the equation  $\kappa = \frac{1}{\omega}$ .

Relative cost of production,  $\kappa$ , may be defined as the ratio of the relative change of the total cost to the relative change in the total production. If  $y$  equals the total cost of production and  $x$ , the total amount of production, the symbolic representation of relative cost of production is  $\kappa = \frac{\Delta y}{y} \bigg/ \frac{\Delta x}{x}$ , or at the limit,  $\kappa = \frac{x}{y} \frac{dy}{dx}$ .

If, using Cournot's symbol,  $y = \phi(x)$ ,  $\kappa = \frac{x \phi'(x)}{y}$ .

This criterion gives the information desired by the

2. The quantity  $\omega$ , the coefficient of relative efficiency of organization, is the same as the quantity which Professor Bowley, following W. E. Johnson, has called the "efficiency of money." A. L. Bowley, *The Mathematical Groundwork of Economics*, p. 22.

entrepreneur. He wishes to know, if he increase his output, whether the relative increase in total cost will be greater than, equal to, or less than the relative increase in the output. That is, he wishes to know whether  $\kappa = \frac{x \phi'(x)}{y} \gtrless 1$ .

Relative efficiency of organization,  $\omega$ , gives, under a different form, the same information as the relative cost of production,  $\kappa$ . The criterion  $\omega$  is defined as the ratio of the relative change in total production to the relative change in total cost. Symbolically  $\omega = \frac{dx}{x} \bigg/ \frac{dy}{y} = \frac{y}{x \phi'(x)}$ . The information desired by the entrepreneur is whether  $\omega \gtrless 1$ .

Since  $\kappa = \frac{1}{\omega}$ , it is obvious that if the value of either  $\kappa$  or  $\omega$  is known, the other may be determined.

*Laws of Relative Cost and Relative Return as Contrasted with Laws of Cost and Laws of Return*

The description of laws of return in mathematical form was first given by Cournot. Cournot<sup>3</sup> shows that if  $y = \phi(x)$  is the expression for the total cost of production, then there are three types of laws of cost or return according as  $\phi''(x) \gtrless 0$ . He avoided many difficulties by contenting himself with a mathematical definition of the laws without passing on to identify them by name as the law of diminishing return, the law of constant return, and the law of increasing return. Without using the customary unprecise designations he amply made good his claim that the condition whether

3. Cournot, *Recherches sur les principes mathématiques de la théorie des richesses*, p. 66, §§ 29-30. He considers, in addition to the above three cases, a fourth, where  $\phi(x)$  is a constant.

$\phi''(x) \geq 0$  exerts very great influence on the principal problems of economic science.<sup>4</sup> It would be conducive to clearness and accuracy if the Cournot criterion  $\phi''(x)$  were regarded as the criterion of laws of cost or laws of return.

In the preceding section the coefficient of relative return, or of relative cost, was defined as

$$\kappa = \frac{x}{y} \frac{dy}{dx} = \frac{x \phi'(x)}{y}.$$

According as  $\kappa \geq 1$  we have to do with the law of increasing relative cost, or of diminishing relative return; the law of constant relative cost, or of constant relative return; the law of decreasing relative cost, or of increasing relative return. Just as Cournot's criterion  $\phi''(x)$  is the criterion of laws of cost or of return, so the coefficient  $\kappa$  may be regarded as the criterion of laws of relative cost or of relative return.

The distinction between the two conceptions may be illustrated. Suppose, for example, that it is required to show the difference between the law of diminishing return and the law of diminishing relative return.

The two criteria are

$$\phi''(x) > 0 \dots (i)$$

$$\kappa > 1 \dots (ii).$$

But, by definition,  $\kappa = \frac{x \phi'(x)}{y}$ , and, as a result of the

4. Cournot, *Recherches*, p. 65. "Dans la suite de nos recherches, nous auront rarement occasion de considérer directement la fonction  $\phi(D)$  [the  $\phi(x)$  of the text], mais seulement son coefficient différentiel  $\frac{d\phi(D)}{dD}$  que nous désignerons par la caractéristique  $\phi'(D)$ . Ce coefficient différentiel est une nouvelle fonction de  $D$ , dont la forme exerce la plus grande influence sur la solution des principaux problèmes de la science économique.

La fonction  $\phi'(D)$  est, selon la nature des forces productrices et des denrées produites, susceptibles de croître ou de décroître quand  $D$  augmente."

inequality (ii), the law of diminishing relative return gives the information that

$$\phi'(x) > \frac{y}{x}, \text{ or } \phi'(x) > \frac{\phi(x)}{x} \dots \text{(iii).}$$

That is to say, in stating the law of diminishing relative return we assume that the marginal cost of production is greater than the average cost of production.

The inequality in (iii) may be written

$$x \phi'(x) > \phi(x) \dots \text{(iv).}$$

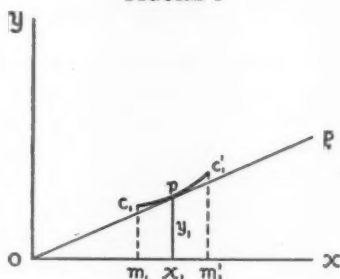
This states the well-known proposition in economic theory that where the law of diminishing relative return prevails, the ordinate of the integral supply curve is greater than the corresponding ordinate of the total cost curve. Economic theory has also led to the conclusion that under these conditions the slope of the supply curve is greater than the slope of the cost curve. This means that

$$\begin{aligned} \frac{d}{dx} \left\{ x \phi'(x) \right\} &> \phi'(x), \dots \text{(v) or} \\ \phi'(x) + x \phi''(x) &> \phi'(x), \text{ or} \\ \phi''(x) &> 0 \dots \text{(vi).} \end{aligned}$$

Here we reach a conclusion in case of diminishing return and diminishing relative return which, by similar reasoning with regard to constant and increasing relative return, may be proved to be general, namely, where a given condition of  $\kappa$  holds, so likewise does the corresponding condition with reference to  $\phi''(x)$  hold. In this particular case we started with  $\kappa > 1$  in (ii) and reached  $\phi''(x) > 0$ , in (vi). Where the law of diminishing relative return exists, there likewise does the law of diminishing return exist. The latter conception is at least as broad as the former: we shall now proceed to show that it is broader.

Auspitz and Lieben have described how a total cost curve is made up of bits of individual expense curves. Following their method of exposition,<sup>5</sup> let us suppose that an individual producer has such a plant that he can produce, with moderate variations of outlay, an amount of commodity ranging between  $m_1$  and  $m_1'$  (See Fig. 1), and let us assume, further, that the total cost

FIGURE 1



of producing amounts between  $m_1$  and  $m_1'$  is given by the respective ordinates of the curve  $c_1c_1'$ , which, by hypothesis, is assumed to be throughout its extent convex to the axis of  $x$ . If  $\phi_1(x)$  is put for the integral cost curve to this producer (1), the convexity of the curve requires that  $\phi_1''(x) > 0$ , and, consequently, that the business should be subject to the law of diminishing return between the limits  $x = m_1$ ,  $x = m_1'$ . Suppose now that, still following the method of Auspitz and Lieben, the price of the commodity is given by the price line  $OP_1$ . At the price  $\tan P_1Ox$  producer (1) could not afford to produce less nor more than  $ox_1$ , for which the total cost would be  $y_1$ .

5. Auspitz und Lieben, *Untersuchungen über die Theorie des Preises*, p. 112, Fig. 27 a.

But when  $\alpha x_1$  units of the commodity are produced we have  $\frac{dy}{dx} = \frac{y_1}{x_1}$ . For any point on the cost curve between  $c_1$  and  $p$  we have  $\frac{dy}{dx} = \phi_1'(x) < \frac{y}{x}$ , and, consequently, by the criterion  $\kappa$  the industry is subject between these limits to the law of increasing relative return. For any point on the cost curve between  $p$  and  $c_1'$ , we have  $\frac{dy}{dx} = \phi_1'(x) > \frac{y}{x}$ , and, consequently, by the criterion  $\kappa$ , the business between these limits is subject to the law of diminishing relative return.<sup>6</sup>

The finding in this particular case of diminishing return is general: The criterion  $\phi''(x)$  is more inclusive than the criterion  $\kappa$ : where  $\kappa$  occurs in a particular form the corresponding form of  $\phi''(x)$  always occurs, but where  $\phi''(x)$  exists in any particular form the corresponding condition of  $\kappa$  may or may not be fulfilled.

#### *Typical Equations to the Law of Supply*

It is desirable to select the typical equation to the law of supply so that the constants in the equation shall reflect the connection of supply with the laws of cost. The types of the supply equations will, therefore, obviously vary according as the values of  $\phi''(x)$  or of  $\kappa$  are taken as the criteria of laws of cost.

We shall first derive the equations of supply by means of  $\phi''(x)$ . The simplest possible assumptions as to the character of  $\phi''(x)$  are summarized in (vii)

$$\left. \begin{aligned} \phi''(x) &= a \\ \phi''(x) &= a + bx \\ \phi''(x) &= a + bx + cx^2 \end{aligned} \right\} \dots \text{(vii).}$$

6. This point, as far as I am aware, was first made by Professor Edgeworth. *Economic Journal*, June 1899, p. 294.

If  $\phi''(x) = a$ , then  $\phi'(x) = ax + b$ , and the variation of marginal cost is described by a straight line. When the law of diminishing return dominates industry,  $\phi'(x) = ax + b$  is the equation to the supply curve. In that case, if  $p_s$  be put for the supply price per unit of commodity, the supply equation is  $p_s = ax + b$ . When the law of constant return dominates the industry,  $a = 0$ ,  $\phi'(x) = a$  constant, and the supply price is  $p_s = \frac{\phi(x)}{x}$ . When the law of increasing return pre-

vails, the supply price<sup>7</sup> is likewise  $p_s = \frac{\phi(x)}{x}$ .

More complex supply equations could be derived in a similar manner from the other assumptions in (vii). But in the first attempts to deal concretely with the law of supply very great advantages will be secured by retaining the simple hypothesis that  $\phi''(x) = a$ , and, in case of diminishing return, that the law of supply is a straight line,  $p_s = ax + b$ .

The criterion  $\kappa$  leads to another useful type of supply curves. The simplest possible assumptions with regard to  $\kappa$  are summarized in (viii)

$$\left. \begin{aligned} \kappa &= a \\ \kappa &= a + \beta x \\ \kappa &= a + \beta x + \gamma x^2 \end{aligned} \right\} \dots \text{(viii).}$$

Suppose that  $\kappa = a$ , a constant.

Since by definition  $\kappa = \frac{x}{y} \frac{dy}{dx}$ , the hypothesis becomes

$\frac{x}{y} \frac{dy}{dx} = a$ , or  $\frac{dy}{y} = a \frac{dx}{x}$ . Integrating, we have

$$y = Ax^a \equiv \phi(x) \dots \text{(ix),}$$

7. Marshall, Principles of Economics, 4th edition, p. 539, note 1, Fig. 36.

which is the law of the variation of total cost with the amount of commodity that is produced.

The derivation of the equation to the supply curve from the equation to the cost curve will vary according as  $\kappa \geq 1$ , that is, according as the business is subject to increasing, constant, or diminishing relative cost.

When the industry is subject to increasing relative cost,  $\alpha$  is greater than unity. The supply price  $p_s$  is equal to the marginal cost of production,  $\phi'(x)$ , and the equation to the supply curve is

$$p_s = \phi'(x) = \alpha Ax^{\alpha-1} \dots (x).$$

When the industry is subject to constant relative cost,  $\alpha = 1$ , and the supply price per unit of commodity is equal to the mean cost of production

$$p_s = \frac{\phi(x)}{x} = Ax^{\alpha-1} = A, \text{ since } \alpha = 1 \dots (xi).$$

When the industry is subject to decreasing relative cost,  $\kappa < 1$ , and the supply price per unit of commodity is equal to the mean cost of production

$$p_s = \frac{\phi(x)}{x} = Ax^{\alpha-1} \dots (xii).$$

In the preceding discussion the laws of supply have been deduced from the laws of cost, and the equations (x) (xi) (xii) show that an expression of the type  $y = Ax^\alpha$  is an appropriate form for the law of supply whatever may be the constant value of  $\kappa$ . It will therefore be allowable to take this type of curve to describe the law of supply directly and then to deduce from it the corresponding law of cost. Further on we shall find a case where it is possible to obtain concretely the supply curve, from which the corresponding cost curve may be deduced, when it would be impossible to obtain directly the equation to the cost curve.

Just as the typical equation  $y = Ax^\alpha$  has been derived from the simplest hypothesis in (viii) with regard

to the value of  $\kappa$ , so, by similar reasoning, more complex equations may be derived from the other hypotheses in (viii). If, for example, it be assumed that the variation of  $\kappa$  is linear we have  $\kappa = \frac{x}{y} \frac{dy}{dx} = \alpha + \beta x$  and the typical equation to the cost curve, from which the supply curve may be deduced is

$$y = \phi(x) = A x^{\alpha} e^{\beta x} \dots \text{(xiii).}$$

#### *The Statistical Derivation of the Law of Supply*

In discussing the law of demand I have shown elsewhere that when the typical equation to the curve has been agreed upon, the empirical law of demand may be ascertained either by the method of trend ratios or by the method of link ratios.<sup>8</sup> The same methods could be used in deriving the empirical law of supply, but in the following illustration the method of trend ratios alone will be employed.

Table I contains the data that are sufficient to deduce the curves both of demand and of supply. The raw material is given in columns II and III. To these figures parabolas of the second degree were fitted by the method of least squares in order to obtain the respective secular trends. Columns IV and V give the ratios of the observations to their corresponding trends, and these two columns suffice to ascertain the law of demand for potatoes. The law of supply is derived from columns VI and VII. In column VI the price trend ratios that are given in column IV are advanced

8. The method of trend ratios was described in an article on "Elasticity of Demand and Flexibility of Prices," in the *Journal of the American Statistical Association*, March, 1922.

The method of link ratios was first presented in *Economic Cycles*, 1914, and subsequently in *Forecasting the Yield and the Price of Cotton*, 1917, and in "Empirical Laws of Supply and Demand," *Political Science Quarterly*, December 1919.

TABLE I. — DATA FOR COMPUTING THE CURVES OF DEMAND AND SUPPLY. THE ANNUAL PRODUCTION OF POTATOES AND THEIR FARM PRICES, IN THE UNITED STATES

I Year	II December Farm prices (cents per bushel)	III Production (millions of bushels)	IV Price trend ratio	V Production trend ratio	VI Price ratio of preceeding year	VII Production ratio of current year
1900	43.1	211	0.794	0.988	....	....
1901	76.7	188	1.397	0.810	0.794	0.810
1902	47.1	285	0.850	1.144	1.397	1.144
1903	61.4	247	1.094	0.932	0.850	0.932
1904	45.3	333	0.798	1.191	1.094	1.191
1905	61.7	261	1.073	0.891	0.798	0.891
1906	51.1	308	0.877	1.011	1.073	1.011
1907	61.8	298	1.044	0.945	0.877	0.945
1908	70.6	279	1.179	0.860	1.044	0.860
1909	54.1	389	0.887	1.170	1.179	1.170
1910	55.7	349	0.898	1.029	0.887	1.029
1911	79.9	293	1.268	0.850	0.898	0.850
1912	50.5	421	0.788	1.207	1.268	1.207
1913	68.7	332	1.054	0.945	0.788	0.945
Mean	...	...	1.000	0.998	0.996	0.999

one year; the production trend ratios in column VII are the same, year for year, as those given in column V.

The correlation of the data for the law of demand for potatoes (columns IV and V) is  $r = -.95$ ; the correlation of the data for the law of supply (columns VI and VII) is  $r = +.80$ . In the following section graphs are drawn for two types of curves.

#### *A Moving Equilibrium of Demand and Supply*

In the preceding section we have seen how the equation to the law of supply when it is deduced from the criterion  $\phi''(x) = a$  is  $p_s = a + bx$ , and when it is deduced from  $\kappa = a$  is of the type  $p_s = Ax^a$ . Exactly corresponding types of equations may be used to describe demand. We know that when the flexibility of prices,  $\phi$ , which is the reciprocal of the elasticity of

demand,  $\eta$ , is placed equal to  $a$  the type of the demand curve is  $p_d = Ax^a$ .

A linear equation to the law of demand may be obtained in a manner corresponding to that in which, by the use of Cournot's criterion  $\phi''(x)$ , the linear equation to supply was obtained from the equation to the cost curve. For example, let  $F(x)$  be put for the money measure of the total utility of the commodity. Types of demand curves corresponding to the supply curves derived from  $\phi''(x)$  will then be obtained by making the following hypotheses as to the variation of  $F''(x)$

$$\left. \begin{aligned} F''(x) &= a_1 \\ F''(x) &= a_1 + b_1x \\ F''(x) &= a_1 + b_1x + c_1x^2 \end{aligned} \right\} \dots \text{(xiv)}.$$

The demand equations deduced from (xiv) will then correspond with the supply equations derived from (xv)

$$\left. \begin{aligned} \phi''(x) &= a_2 \\ \phi''(x) &= a_2 + b_2x \\ \phi''(x) &= a_2 + b_2x + c_2x^2 \end{aligned} \right\} \dots \text{(xv)}.$$

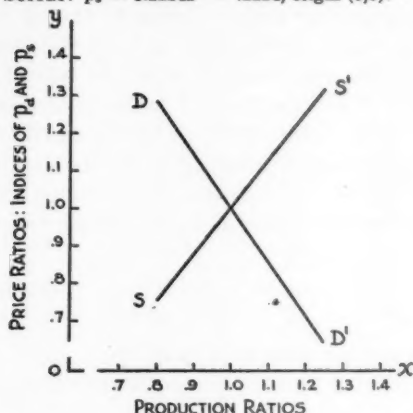
If, for example, the assumption is made that  $F''(x) = a_1$  and  $\phi''(x) = a_2$ , the equation to the law of demand is  $p_d = a_1x + b_1$ , and the equation to the supply curve is  $p_s = a_2x + b_2$ . Figure 2 shows these types of equations fitted to the data given, respectively, in columns IV and V and in columns VI and VII of Table I.

In addition to the great technical advantage of having the equations to demand and supply in the simple linear form, there is the theoretical gain of having the graphs of supply and demand pass exactly through the mean of the system of points on the scatter diagram. When the straight lines are fitted by the method of least squares, they must pass through the mean of the system. And when the production ratios and price ratios are deduced from parabolic trends fitted to the

FIGURE 2. A MOVING EQUILIBRIUM OF DEMAND AND SUPPLY.  
POTATOES.

DEMAND:  $p_d = -1.425x + 2.425$ , origin (0,0);

SUPPLY:  $p_s = 1.2224x - .2224$ , origin (0,0).



data by the method of least squares, the means of these ratios are, within the limit of error, equal to unity. In the particular case of the data referring to potatoes, Table I shows that this latter statement is true.

In consequence of the graphs of supply and demand passing through the point whose coördinates are (1.0, 1.0) the demand for the commodity and the supply of the commodity are in a moving equilibrium about the trends of prices and production. When, for example, the supply price ratio of a given year was unity, the production ratio of the following year was unity; and when the production ratio of that following year was unity the demand price ratio of the same year was unity. These facts are illustrated <sup>9</sup> in Figure 2.

9. By the use of a simple device, described in the article "Elasticity of Demand and Flexibility of Prices," *Journal of the American Statistical Society*, March 1922, it is possible to pass from curves in the ratio form to corresponding curves referring to absolute quantities.

The second type of curves for the laws of demand and supply is, as we have seen,

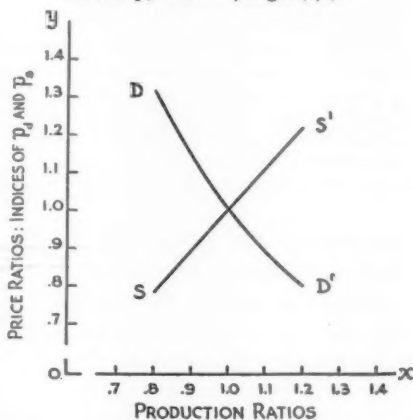
$$p_d = A_1 x^{a_1} \quad p_s = A_2 x^{a_2}$$

If these curves are fitted to the trend ratios directly by the method of least squares, values of  $A_1$  and  $A_2$  will be obtained that will vary slightly from unity. But if the assumption is made that when  $x = 1.0$ ,  $p_d = 1.0$  and  $p_s = 1.0$ , which we found to be true practically and to

FIGURE 3. A MOVING EQUILIBRIUM OF DEMAND AND SUPPLY.  
POTATOES

DEMAND:  $p_d = x^{-1.2210}$ , origin (0,0);

SUPPLY:  $p_s = x^{1.0323}$ , origin (0,0).



be fulfilled theoretically in the linear types of curves, the above equations take the simple forms

$$p_d = x^{a_1} \quad p_s = x^{a_2}$$

The graphs of these equations are given in Figure 3. Again there is a moving equilibrium of demand and supply about the secular trends of prices and production.

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## ECONOMIC PSYCHOLOGY AND THE VALUE PROBLEM

### SUMMARY

The basic difficulty in economic theory is the philosophical problem of the meaning of explanation in connection with human behavior. I. Motive or desire in human conduct is the analogue of force in mechanics, 375. II. Is force real or merely symbolic, leaving movement (behavior in the case of human beings) the only fact open to description or study? 379. — This question is merely formal in physics, for we know forces by their effects alone, and hence unambiguously if at all; but in the realm of conduct, we know motives in ourselves directly and in others by communication, in addition to inferring them from observed behavior, and the two sources of information disagree considerably. III-IV. The intellectually embarrassing but unescapable fact of purposiveness, in thought as well as conduct, 386. — V. The place of motives and their treatment in economics, which has to be critical as well as descriptive and logical, — a branch of esthetics and ethics as well as of science, 400. — VI. The objective of economic activity and the point of view of social criticism of the economic order, 406.

At the present moment economic interest and discussion are in one of their periodic swings away from the more philosophical aspects of the subject, in the direction of the empirical and the concrete. Expressions of weariness and impatience with methodology and speculation and all generalities are the familiar note. We are urged to be "scientific" in the manner of the laboratory sciences, to devote ourselves to the observation of "facts," and to eschew generalization and all assertions outside the realm of empirical verification. Such movements come and go. The balance between observation and analysis will always be a shifting one. The philosophical interest never dies out, and will always come into its own — and be overdone in its turn. Not for any long period, certainly, can any science which deals with

human conduct and social policy remain aloof from the broad and difficult but unescapable problems connected with the nature of value and its relation to reality, and the methods by which both are tested and known. The great names in the history of economic thought are to a remarkable extent prominent also in the history of moral science and of logic, and it is no more probable, than from the standpoint of economics it is desirable, that this condition of affairs will be greatly changed in the future.

Indeed, economics stands, in a somewhat peculiar sense, at the meeting point of the three great branches of thought or fields of intellectual endeavor. The science which deals with the satisfaction of wants is, in the first place, a science of ways and means, and hence concerns itself with the entire body of natural science in its pragmatic aspect as a technique for controlling nature and bending natural forces and materials to the will of man. And in this natural science, as a technique of prediction and control, are included the facts and laws of human behavior as well as those pertaining to the behavior of external things. But the study of want-satisfaction must consider also the wants themselves, and if it is to have anything to say about policy, it must consider them critically; hence it comes into the closest relation with those disciplines which undertake the criticism of values, that is, with esthetics and morals. Between and around these two fields of facts and values is the central problem of philosophical inquiry, the problem of knowledge, which in fact can least of all be neglected by the student of any phase of conduct. For surely it is a commonplace which it would be unpardonable to ignore, that human beings act, not on the basis of fact and reality as such, but on the basis of *opinions* and *beliefs about facts*, and what is called *knowledge*, but which at

best falls notoriously short of the implications of that term. From a logical point of view therefore, one who aspires to explain or understand human behavior must be, not finally but first of all, an epistemologist. These general problems of scope and method all come to a focus in the central question of the relation between motive and conduct, which is one of the meanings of that most ambiguous and meaningless of words, the term "psychology."

# I

The economist meets the problem of conduct and motive at every point and stage of his work, but perhaps first and most unavoidably in the study of consumption. *Why* do men purchase goods, and particular amounts of different goods? More specifically, what answer that will be in any degree enlightening can be given to the question why the amount of any good purchased bears a fairly definite relation to its price, decreasing as the price increases, if other conditions are unchanged? Relatively narrower and less important aspects of this problem will here be passed over, in order to come at the central issue without delay or distraction of interest.<sup>1</sup>

1. One of these side issues is the question whether desire is to be treated as relative or absolute. It seems clear to the present writer that desire, which, as will appear, is the analogue in psychology of force in mechanics, is, like any other force, relative in nature. One force is not merely *measured* by another force, but its existence as a magnitude is conditioned by that of some equal force in opposition. Value, similarly, is an aspect of choice, and valuation is intrinsically a comparison of values. But no practical confusion is likely to result from taking the theoretically erroneous position that desire is an absolute, and discussion therefore appears to the practically minded as a mere logomachy.

Another issue more intimately related to the central problem is that of the correct method of aggregating units of desire or satisfaction into totals. Passing over the further question of the relation between quantity of desire and quantity of satisfaction, it is a fundamental principle that the attractive force of a unit of commodity decreases with the increase in the number of units. The question is whether the value of a supply is to be regarded as the sum of the values of the units considered

This central issue is nothing less than the question whether conscious desires or conscious states of any sort can be regarded as "causing" or "explaining" conduct. The scientific study of behavior is notoriously unable to find a place for conscious states as causes, and the weight of psychological opinion is increasingly against treating them as such. Psychologists began a long generation ago, with the advent of the James-Lange theory, to hold that feeling results from action rather than action from feeling; that we desire because we act rather than act because we feel desire. Accepting this view, we should have to say that the consumer feels a desire for a good because he purchases it. Still more recently the tendency is simply to leave desire and satisfaction and all feelings out of the scientific discussion of behavior and treat every action as a response of the organism to a situation or stimulus.

From a strictly scientific point of view this position seems unescapable. Science, we are perpetually reminded, deals with *observed facts*, and their relations of coexistence and sequence. It must rigorously exclude "metaphysical entities" of every sort. And a feeling, manifestly, is not an "observed fact"; it is an inference from the behavior itself, or at most it is "reported," which is to say that it is inferred from a report, which report itself is but an observed behavior fact. Conscious states are certainly never observed through the senses, they are not directly observed in any sense in any other person; and it is far from clear just what it means, or

successively or as the product of the value which one unit actually has in the given supply into the number of the units. In technical language, is "consumers surplus" real? The analogy of mechanics does not throw light on the question, because a mechanical force produces the same effect in a combination that it does when acting alone. Thus the answer to the question depends on one's fundamental conception of economics, whether and in what sense values are to be viewed as analogous to mechanical forces.

how true it is to say that one observes even his own conscious states as such. The question is acutely controversial. If we do explain actions by feelings, we must go on to explain feelings by the situations in which they arise in connection with the character of the "organism," its "character" being just its behavior habits as ascertained by previous observation. An explanation which stops at facts of consciousness is idle and useless. The purpose of knowledge is to predict, and the use of prediction is control. But we can predict only on the basis of some readily observable and identifiable mark or condition. It is useless to know that a human being who feels in a certain way will act in a certain way, unless we have some perceptible indicator of the feeling, which indicator can be only a behavior fact. Equally useless is it from the standpoint of control unless we know how to produce and manipulate feelings, and this can be done only by means of established behavior sequences.

Thus, unless it is assumed that feelings have some real existence apart from the observable physical facts pertaining to the organism, they are superfluous in explaining behavior, and if they do have such a real existence, they actually make prediction and control impossible to the extent that they function as causes. If the desire which (as we say) prompts an act is rigorously dependent upon (correlated with) the situation in which it arises, then it is simpler and more satisfactory to predict the act from the situation directly, especially as the desire itself can never be observed and has to be inferred from previous behavior. If the desire is *not* perfectly correlated with the situation, then to that extent the act which it "causes" cannot be predicted from previously known data at all. Knowledge of coexistences and sequences among facts which cannot be observed is futile, even if we assume that it can be real.

There would be absolutely no point to measuring the specific gravity of lead or the tensile strength of iron if we had no way of knowing when we had lead or iron to deal with except to measure the density or strength as the case might be. We do not dissect a dog to find out what is inside of that particular dog, and the significance of knowledge as to what is inside of dogs as a class depends on the possibility of identifying the members of that class in some simpler way than by dissecting them. Just so, it is futile, even if possible, to know that a certain desire causes a certain act, unless we have some way of knowing when that desire is operative other than to wait and see if the associated conduct takes place. The utility of science depends on its ability to distinguish between edible mushrooms and poisonous toadstools *without* eating them and awaiting the result. The cogency of this reasoning seems to leave no possible way of escape. At most, it may from this point of view conceivably be a matter of purely scientific, abstract interest that certain feelings go with certain conduct; it is surely evident that we cannot logically regard the conscious state as causing or explaining the conduct in any significant sense.

And yet we do, habitually, and for all practical purposes universally, look at the matter in just this "unscientific" way. Professor Watson and his confrères may expostulate with us all they like about the error of our ways — we go right on thinking of conduct as in the main the effect of desire, and it seems impossible to talk sense about it from any other point of view. Where reason and common sense are found in such flagrant contradiction, the verdict of common sense cannot be brushed aside without examination from a point of view above the position of the conflicting claimants; philosophy must be called in to arbitrate the controversy. If

the two are simply left to fight it out, the result is a foregone conclusion; all the dynamic power is on the side of common sense and it will go on doing what it finds irresistibly convenient — "in erring reason's spite." The further course of the argument will sketch the philosophic aspects of the question, and will show that in this instance the position of common sense is better grounded in terms of the ultimate and inclusive facts of experience than is that of scientific logic. In the process it will also become increasingly clear that the sharp distinction between observation and inference or fact and "metaphysical entity," stressed so much by the scientific dogmatist, is based on a naïve dualism which is wholly untenable. The truth is not only that the fundamental concepts of science are as different as possible from the "facts" of the plain man's experience, but also that even these latter are far indeed from the character of immediate sense-data. On the other hand, much that the devotee of natural science methods dismisses contemptuously as "mere emotion" may turn out to have as strong a claim to a counterpart in ultimate reality as can be put forth by any human experience whatever. It will throw light on the problem to consider briefly the analogous case of physical science in its effort to explain the "behavior" of material objects.

## II

Mechanics is generally thought of and defined as the science which studies the action of "forces." Yet the physicist constantly recognizes that he really knows nothing about force, and that if such an entity exists, it is not open to human observation. The uneducated man is likely to say that we know forces by their effects; but to the worker, who has been taught to think critically about what he is doing, it is clear that we really

know only the effects themselves. We assume, or infer, the forces, for no objective reason, but because it pleases a certain queer bias in our minds to do so. It seems to "simplify" our thinking. All that physics or any science can really do is to describe what is observed to happen; and the careful and candid scientist is especially conscientious in eschewing any knowledge of what "makes" things happen, or whether anything does. The "laws" of science are mere statements of dependable coexistences and sequences among events. The goal of scientific "explanation" is simply to formulate these laws in terms as general as possible.

And yet in practice, it is admittedly impossible to get along without the notion of force! Mechanics has always used the notion freely, while explicitly recognizing that it stands for no real existence known to us, but is simply a convenient way of saying that things happen according to law; that is, that the same thing always happens under the same conditions. It is easy, as it is common, to disparage "metaphysical" entities like the Kantian Ding-an-sich and Spencer's Unknowable. But the simple, indispensable notion of force is of exactly the same character; and the candid thinker has to recognize on every plane of experience that our thinking cannot be carried on without such conceptions. They have to be accepted as realities as much as any of our thought-content.

For an illustration, consider the most familiar case of force, namely, gravitation. We say the apple falls to the ground because the earth "attracts" it, and that the planets are controlled in their orbits by a similar attraction. Yet it is clear that all we can observe, or know, is that the bodies do move along courses and at velocities which can be described by unvarying formulæ. What then is the use of the idea of gravitation? and what was

the great discovery of Sir Isaac Newton? The discovery was simply this: that the *same* formula is applicable to all these cases. Newton's inspired idea was that the moon is all the time falling toward the earth, and that the law or formula of its fall might be the same as that which Galileo had found for the fall of objects toward the ground at the earth's surface. The path of the moon under the influence of inertia alone would not bend around the earth, but would bear away in a straight line at a tangent to the actual orbit. Thus the moon is at every moment "falling" away from its natural course along a line roughly at right angles to it and toward the center of the earth. Calculation at first showed that the formula for the rate of its fall was *not* the same as that found by Galileo (with allowance for the thinning out of the intensity of the attraction with the distance); but when more accurate astronomical measurements were made, the guess was confirmed and the great discovery established. Newton further found that the same formula would explain the elliptical shape of the orbits in the solar system and the other mathematical relations which had been noticed by the great German astronomer Kepler and named Kepler's Laws. Newton's law of gravitation "explained" all these phenomena by reducing them to a common principle and showing the essential similarity between the mysterious movements of the heavenly bodies and the familiar movement of things falling to the ground. As to *why* — in any other sense — *any* of the movements happen as they do, or happen at all, it has absolutely nothing to say.

From a scientific point of view the problem of economic behavior is parallel to that of the celestial motions. The "desire" which we say "makes" men buy goods is analogous to the "attractive force" which

makes objects fall to the surface of the earth and planets fall toward the sun. What we really observe in the economic situation is the fact that a good is purchased, just as what we observe in the other case is the fact of movement. The notion of desire serves to simplify the statement, in accordance with our mental prejudices, in the one case, as the notion of attractive force does in the other.

In economic and other human behavior, however, the situation is complicated by the fact that we *feel* desire in ourselves and associate the feeling in a definite way with our actions, while other human beings can and do talk to us about their desires in relation to their conduct. Thus we appear to have an additional reason for believing that feelings have something to do with response to situations. Candid reflection unquestionably shows that, in fact, the idea of force in connection with the motion of objects in space is a feeling of effort which we read into them on the basis of our own experience. But for our feeling of our own weight, we should not have the idea of gravitation as a force in any other sense than a law of motion; we should never form the idea of space and motion at all if we lacked the power of voluntary movement in ourselves. Just so, too, logically speaking, we merely "infer" consciousness in other human beings from the "movements" of speech, facial expression, and the like, by which, as we say, they "communicate" with us. There is no clear logical reason why we do not regard the behavior of objects generally as communicative, — at least until our attention is called to the problem and we have thought hard about it for a time, — any more than there is a clear logical reason why we do so interpret certain behavior facts in human beings. Careful examination of the matter will show that this fact of *communication between consciousnesses* is the fun-

damental fact of knowledge and the nearest we can ever get to an "ultimate" in human experience. For the present it is needful only to record two obvious facts, more or less contradictory between themselves. The first is that, logic notwithstanding, we do recognize some behavior as communication from other minds and do not so interpret other behavior. The second is that no human being really disbelieves in the reality of force as an element in the external existent world, any more than he doubts the fact of consciousness in his fellow human beings. The contradiction between logic and common sense is aggravated rather than resolved by appealing to the analogy between mechanics and human behavior.

This brings us to the threshold of the fundamental difficulty in economic psychology. In mechanics there can be no discrepancy between forces and their effects, because we have no source of information regarding the forces except the effects themselves. We "infer" the force from the effect, and in the nature of the case the force is always exactly what is required to "explain" the effect observed. But in human behavior we have two sources of information in regard to desire (which is the analogue of force), and the two sources *disagree* more or less. Each of us is immediately aware of innumerable desires which do not, to our knowledge, find expression in any outwardly observable behavior, and has immediate knowledge to the effect that the acts most directly prompted by desire do not exactly express the desires as felt and often diverge grotesquely from them. No experience is much more common than surprise or disappointment at the things we find ourselves doing. Likewise our communication with other human beings acquaints us with the same situation in regard to them. The knowledge of human desires we get through social

intercourse reveals them as divergent in a very considerable degree from the desires which are necessary to explain in the scientific sense the behavior which we observe.

Here is the heart of the paradox. We have two sources of information in regard to the causes of human behavior, but they do not tell the same story, and yet we cannot disbelieve in the validity of either of them. We "know" that there is a causal relation between desire and conduct, and we "know" also that the causes do not accurately or closely correspond with the effects. This is the eternal dilemma of hedonism.<sup>2</sup> In saying that conduct is always controlled by the strongest desire, we may mean either of two things, either desire as the analogue of force in physics, or desire *as felt*. In the former interpretation the statement is a mere truism; in the latter it is merely false. The hedonist must take his choice between these two "horns."<sup>3</sup>

For the purposes of an economics which will be scientific in the sense of laboratory science, the course to be

2. The term hedonism is here used to designate the explanation of conduct by *desire*, not pleasure. This is the correct formulation of a scientific ethics, or rather, again, of a scientific theory of conduct, for a scientific ethics is a contradiction in terms. The idea that quantity of satisfaction corresponds to quantity of desire is one which seems quite too unreasonable for any thinking person to entertain. When the hedonist speaks of quantity of pleasure, he means quantity of *anticipation* of pleasure, that is, he means quantity of desire. (In the writer's opinion even anticipation of pleasure is not really identical with desire, as a fact of experience.)

3. Historically the doctrine described is known as psychological hedonism and is distinguished from ethical hedonism. The latter is the doctrine that pleasure *ought* to be the goal of every action. This position involves all the difficulties of outright idealism with numerous others peculiar to itself; but discussion in detail is outside the field of the present paper.

The question-begging character of hedonistic reasoning also appears in its implication that all human beings are of necessity absolutely selfish. We all like what we like and dislike what we dislike, undoubtedly. But the contention that there is no difference between selfishness and unselfishness is practically a conclusive *reductio ad absurdum* of the doctrine which leads to such a position as a conclusion.

pursued is well marked out. It will be, like mechanics, behavioristic in theory but not so in terminology or in fact. It will employ freely the concept of desire as an explanation of behavior, as mechanics employs the concept of force as an explanation — because it is irresistibly convenient to do so. And it will carefully make it plain, as does its sister science in the corresponding case, that the concept is “really” but a short-hand manner of expressing the fact that there is uniformity of sequence or “law” in human responses to situations. And everyone whose common sense is not suppressed by logical sophistication will know that in the one case as in the other it is “really” no such thing! that desire and force are parts of the real universe with at least as good an epistemological pedigree as any observed behavior datum. This aspect of the matter will be more fully considered later on. For the moment the significant point is that scientific economics must keep sharply separate and distinct the two conceptions of desire, namely, the desire which explains observed behavior and is the analogue of force in mechanics, and desire as known by the individual human being in himself directly, and in other individuals through language and social intercourse.

Thus scientific economics is restricted in its data to behavior facts. It cannot deal with feeling facts, except as a mode of expressing behavior facts, for two reasons. In the first place, the facts of desire and satisfaction cannot be accurately observed and measured, and scientific economics must dogmatically and rigorously identify them quantitatively with their objective expressions in measurable goods or services taken up or given off, just as the physicist identifies forces quantitatively with their expressions in movement.<sup>4</sup> The second reason

4. Economics, like physics, may have to add the concept of “potential” movement, a notion still more obviously a convenient instrumental fiction.

for the exclusion of feeling facts, as known through sources independent of their expression in action, is that this second kind of knowledge, in so far as it gives verifiable information, contradicts to a considerable extent that furnished by the first source. Therefore economics, in dealing with these data also, would be trying to ride two horses at the same time over courses too divergent for comfort. It is better to leave distinct sets of data to different sciences; and the facts of consciousness and their relation to the facts of behavior form the province of the already well-established disciplines of psychology and ethics.<sup>5</sup>

### III

So much for the methodology of economics as a science, in the strait and narrow sense of the term, as the generalized statement of verifiable coexistences and se-

5. When economic psychology is given the above interpretation, and the instrumental, non-ontological character of desires and motives as used in economics is sufficiently emphasized, there can be no objection to stating the principles of utility and disutility in the conventional form. Otherwise, they are true only in rough approximation to the facts of experience.

The classical economists also sensed the difficulty in the scientific treatment of human behavior, and the famous "economic man" represents their method of meeting the problem. Some such device is imperatively required. This one is to be criticized only for its vagueness as to the place of consciousness in the interpretation of behavior. The hedonistic man, the selfish man, and the "rational" man are closely related conceptions, all designed for the same function. All reduce, if consistently applied, to the thesis developed above, that the scientific man is one who does what he wants to do and whose wants are consistently related to the situation in which the man is placed. Followed out, this really means, as we have shown, simply the mechanistic view of man as an automaton, one whose conduct is in accordance with law in the scientific sense — that is, completely describable in terms of uniform relations to his situation. He may be conscious, but only in an "epi-phenomenal" sense, and consciousness is to be left out of the scientific description of behavior. The French philosophers of the Enlightenment carried the idea to its necessary logical limit, as the English hedonists did not. It has been a historical trait of the English mind to place truth ahead of consistency!

quences in its special field. But it is not the whole end of life to be scientific — a fact sometimes overlooked. Science itself is instrumental, relative to prediction and control, and controlling events is more than understanding them in the scientific sense. Economics especially is by no means as separable from its corresponding art as are the natural sciences — and separation of these latter is not as complete as it sometimes appears. We should like to insist on the imperative and equal importance of two things: that the economist must be more than a scientist, and that he must know when he is a scientist and when he is something else. Practically speaking, he is always more or less of a reformer as well, and one of his special difficulties is that of combining these two rôles without confusing them to the detriment of both. In connection with the problem of control, the function of the scientist is to answer the question "how?" — how things can be done. But before anything is done some one has first of all to answer the question "what?" — what is to be done, what is desirable. This question makes it necessary to consider the relation between motive and conduct from an entirely different point of view. To the reformer's prior question, the technique of science has, in the nature of the case, no answer at all to make; and we must contend also that the reformer's task of carrying out "control" includes enormously more than following scientific directions.

Too much emphasis cannot be given to the first point. The *first* step toward control is to answer a question as to *what* shall be done. *This question can be answered only in terms of motives, in just the sense in which science cannot consider them.* Science, as has been shown, can recognize motives only as causes, as the uniform antecedents of acts. In this sense there can be no question about them, except to find out what they are, which is to say,

to get back of them to some observable behavior fact as an identification mark and eliminate them from the discussion. One may feel curiosity as to which of two motives or desires is the stronger, but that is just another way of saying that one is curious as to what will action *will* be performed; that the stronger desire dominate is a truism; and anything of the nature of "choice" between motives, that is, anything of the nature of decision or *real control*, is excluded from the moment the scientific point of view is adopted. The whole field of interests, as interests, lies outside the realm of science, in a realm which it must treat as non-existent. It can only view ends as forces, which is to say as fictitious links between antecedent and consequent in behavior, manufactured to humor a mental caprice.

Now a human being cannot live in the realm of science alone; he cannot really treat or regard himself as an organism automatically expressing its nature in responses to situations. *To live, on the human plane, is to choose.* Possibly we can conceive of life reduced to the plane of scientific curiosity, but there would still be curiosity itself as an interest calling for explanation. One must still choose to be curious; and the attempt to explain this choice in terms of a given motive as cause raises the necessity of explaining that motive either by a mechanical cause or by a choice. Thus one either eliminates control or embarks on an infinite regressus of explaining choices by motives and motives by choices without end — an absurdity. Curiosity is one motive which obviously cannot be reduced to uniformity of sequence. It is of its essence that the stimulus situation is *not* uniform in physical turns, nor the physical result of the action foreseeable. Intellectual problem-solving activities can be discussed only in terms of quality of

conscious experience.<sup>6</sup> Even the attempt to explain mechanically all *other* interests except the scientific interest in explaining them reduces life to a basis of pure contemplation not to be approximated outside a Lamaist monastery, and one which is clearly the antithesis of the ideal of control actually preached in scientific literature. There is no escape from the "prior question" which, everywhere in life, is the question of the end; and the asking of this question involves recognizing the existence of ends as something entirely different from scientific causes of acts. The economist as a scientist may adhere to behaviorism; as a reformer and as a man, he must have a psychology and an ethics, else, as a brilliant English economist recently put it, he may possibly support life, but cannot be expected to enjoy it.

Closely connected with the recognition of ends which are facts but not causes is the second point, that the application of scientific technique is by no means all of the process of control; in the field of human activity there are also causes which are not "facts," in the scientific sense. The natural scientist, even if he does turn artist and engineer, confronts the disturbing, non-scientific factor of purpose in a relatively simple form; purposes *toward* his material are implied in the fact that he studies it; but at least his problem is not complicated by purposes *in* it. But this is just what the social scientist does meet at every turn. Every one of the human beings whom he seeks to understand and potentially to control, harbors his own purposes of understanding and control in regard to all the rest, including the scientist him-

6. In fact, these statements also apply to all the so-called instincts in man. The uniformity in both stimulus and response is in the internal conscious tone, not in the physical situation or the physical act. It would be in the interest of clear thinking to restrict the term "instinct" to innately determined uniformities of response to stimulus in the objective, physical sense. This would practically exclude the term from discussion of human behavior.

self. Social control is a phrase used very freely these days; it is one of those terms much easier to use than to define. The notion of self-control in the individual is difficult enough. Who is the controller and who the controlled? who the potter and who the pot? Social self-control involves the same difficulties *plus* innumerable others. It is self-control *plus* mutual control, and both involved to the *n*th degree. The social scientist cannot, without being grotesque, place himself over against society in the relation of a gardener to his vegetables. Even in experimenting with the higher animals, it might well be necessary to go outside the realm of behavior technique, to take some account of the creatures' feelings in order to achieve any large success in getting them to do one's will. Surely the man who would undertake to treat human society merely as material for scientific manipulation, to control it by finding the laws of its response to stimuli and devising stimuli to provoke the responses he might desire, would have to be classed as a monster or an imbecile. He might have abundant intelligence, of the scientific sort, but would be lacking in "sense." There is nothing forcibly to prevent an individual from arguing that conflicts of purpose within human beings are liquidated on the principle of composition and resolution of forces; but he cannot really apply the theory to himself, and the attempt to apply it without substantial modifications to others or to society will lead to undesirable consequences.

Let it be understood that we are not discussing metaphysics, but practical methodology. The scientific dogmatist is free to maintain that "really" it is altogether a matter of technique, of mechanical cause and effect. This cannot be disproved, and may be "true" in the metaphysical sense. All we are asserting is that, practically speaking, people have to be treated both as if they

had feelings and as if the feelings and attitudes of the person who is attempting to influence them also made a difference. It may be "true" that the attitude of the controller operates only by influencing his own behavior and that only this has any influence over others. But it is certain that the "others" do not think so, and just as certain that the technique of control cannot in fact be reduced to behavior formulæ with feelings left out, tho some persons can of course act a part more effectively than others, as individuals also differ in gullibility. In practice, the "spirit" of an action counts, as well as the action itself, and is often vastly more important. The relation of mutuality must be recognized. The man who expects to influence others must work more through their feelings and his own than through explicit physical stimulus and response. The interpretation of human conduct in terms of "behavior patterns," inherited or acquired, in relation to "situations," may be metaphysically correct, but it will not work.<sup>7</sup>

7. Speech in particular cannot without absurdity be treated as mere physical behavior, and the behavioristic term "language habit" does grave injustice to the richness and variety of life. The notion of habit is of possible applicability to the utterance of words used in a purely literal sense — if any language outside of mathematical symbols ever is strictly literal, an assertion open to doubt. It will not fit at all the other type of language, which is more important and more common in cultural intercourse, the figurative, suggestive use. Language as an artistic medium must not be confused either with the mere tool of factual communication or with mechanical incitement to action. Actual speech almost always contains a considerable admixture of the first element. No two people talk identically the same language. The great majority of sentences spoken or written express and convey to the hearer or reader ideas to some extent original and unique. How we ever learn to communicate thought and feeling seems profoundly mysterious. Induction by association appears wholly inadequate to explain the result, certainly in a creative literary genius and his readers. The writer is impelled to believe to some extent in an intuitive "faculty" of communication and interpretation. Yet our communication is admittedly very imperfect. Two critics get very different impressions from a book or poem; and in social science and philosophy, discussions of fact have a way of transforming themselves into arguments about what somebody really said. Yet communication of new ideas and emotions is a fact, and one which resists mechanistic explanation.

The matter may be summed up by saying that human control is in practice a phenomenon of art and morals to a greater extent than it is one of mechanical technique. Art and morals themselves *may* be *theoretically* reducible to technique, and do unquestionably consist in part of the application of established causal principles in the production of effects foreseen and willed. But anyone who asserts that they involve nothing more than that, or that mechanical process is their essential nature, simply places himself outside the discussion of the things of art and morals. Art, after all, is "expression" — of ideas and emotions; and the potency in human relations of sympathy, anger, personal force and feeling attitudes generally, is not to be gainsaid. At this point the economist and sociologist would do well to take lessons from the experience of the older sciences of human control, the law and medicine. The inadequacy of mere rules and the necessity for a humanized administration of law have surely been demonstrated to the satisfaction of the most critical, as has also the impossibility of limiting attention to the behavior facts without regard to the "intent" of the law and the "intention" of the accused of crime or of the parties to a contract. Even in medicine, which is supposed to be a matter of purely physical cause and effect, we observe a remarkable shift in emphasis from chemical to moral factors. In the personal relations side of business administration, the vogue of "scientific management" was short-lived, and has long since given place to emphasis on the "human" element.

#### IV

The foregoing is all on the plane of practical expediency and is chiefly negative in import. It has aimed to show what the economist can *not* do, namely, that he

cannot restrict himself to the canons and methods of objective science, if he wishes to have a part in improving social life.<sup>8</sup> The interpretation and control of human events call for *more* than that. The discussion would be incomplete without some attempt at a suggestion as to what the "more" is to be; what can be said of esthetics and ethics, beyond the fact that they are "not" natural sciences altogether? and what is the relation of economics to all three? The practical discussion in the previous sections of the paper leads to reflections which seem to the writer to throw some light on the deeper phases of the value problem. The general drift of these can be indicated in a few paragraphs.

The corner-stone of the scientific attitude is skepticism; it must insist on nothing so much as the repudiation of all "emotion" as a source of knowledge; to science, faith and will-to-believe are synonyms for sin. Thus in human relations the scientific attitude is well summed up in the aphorism quoted by Schopenhauer that whoever forgives and forgets throws away dearly bought experience. Morality, as the term is used, is therefore as antithetical to science as faith itself. The effect of this skeptical attitude is sharply to accentuate the naïve dualism of the plain man, the distinction between the real and the imaginary, the objective and the subjective, or, as Walter Lippman most naïvely puts it, between the world outside and the pictures in our minds. No criticism can be made of this position, in its place — that is, *adopted for the purposes of science*. Certainly nothing is more needed in the thinking of the public to-

8. It would, of course, be possible to quibble over the meanings of both the terms "objective," and "science." They are used here in the sense in which natural scientists use them, to refer to verifiable observation through the senses. The writer agrees with the behaviorists in holding that verbal reports of introspection used in the "science" of psychology are not observation in the same sense. The further course of the discussion will, it is hoped, make the matter clearer.

day than the cultivation of regard for facts — in questions of fact; the objective attitude — in situations where the objective attitude is the thing that is required!

Science is to be criticized, however, for making the skeptical attitude a universal and only virtue, and this not so much because this *ought not* to be done as because it *cannot* be. It is merely ignoring fact not to recognize that the skeptical attitude itself is an emotion, and likewise the intellectual satisfaction that comes from scientific comprehension and explanation. The skeptical attitude is assumed for a purpose and is justified because it serves a purpose: it is a means and not an end, and the ends which it serves must be at least as real as the data of skeptical science. Skepticism or detachment and disinterestedness as an absolute principle leads to the position ascribed to the members of the ancient school of Pyrrho, that they would not admit that they denied, and doubted whether they doubted. A will-to-believe is, after all, the only alternative to a dogmatic negation of thought and of life.

In science and in philosophy there is great danger that the cultivation of the skeptical attitude may be overdone. It is in a way of becoming a new dogmatism, as false and pernicious as the medieval dogmatism of faith, which made belief as such a virtue, meritorious in proportion as the doctrine believed was absurd and incredible. In economics and sociology, certainly, the great desideratum of the present day is less an increased development of the scientific spirit than it is a spirit of critical discrimination between questions of fact and questions of value and purpose, between scientific problems in the proper sense and problems of taste and judgment, with the use of an appropriate and significantly different method of attack on the two sets of

problems, when they have been separated. Scientific dogmatism naturally denies the existence of everything which will not pass its tests as a fact. Hence it is reduced to the dilemma of denying conscious purpose altogether or attempting to treat purpose on the level of fact, and it is impossible to do either, as we have already demonstrated. In consequence, we have as the prime desideratum in social science, as just suggested, a penetrating and rigorous study of ends, the recognition of the kind of things they are and the development and application of an effective methodology for studying them. What is required is nothing less than the basing of social science upon a sound philosophy of knowledge and reality.

Now it is a philosophical commonplace that the sharp dualism of fact and wish disintegrates at the first flash of critical scrutiny. This relation is closely connected with the relation between observation and inference; and between these two things science is equally insistent upon drawing a sharp distinction. What is "really" perceived, and what is "only" inferred or seen because it is wished? The least examination shows that no clear separation can be made. In discussing the problem of economic demand it was pointed out that science regards our knowledge of the desires of any person except ourselves as an inference from behavior of some sort — speech, gesture, facial expression, and the like. Consciousness is not an observed fact, but, like force in mechanics, a "convenient" assumption (convenience being obviously a purposive, emotional category), and cannot be admitted as a scientific datum. But reflection makes it clear not only, as already suggested, that we "infer" force, and the consciousness of other persons, from our own consciousness, but that we cannot perceive the objects themselves as real without making this

inference to a certain extent, without reading our own experience into them. This has been familiar matter since the days of Hume, who also — hard-headed Scotsman and thoroughgoing skeptic that he was — agreed with the theologian Berkeley that the primary as well as the secondary qualities of objects all resolve themselves into mental states of the experiencing subject. Hume added only that the subject himself also disappears in the same mental states. Other "subjects" of course share the same fate.

No logical answer has ever been given to the reasoning of Hume, and it seems clear that his conclusion must be accepted as logically final. Approaching the matter skeptically and reasoning logically, there is no such thing as the perception of reality, and all that exists is the flow of conscious experience of which "I" am immediately aware. This is solipsism, but with "I" understood to be not a self in any real sense, but just a stream of consciousness. Now, of course modern psychology recognizes, and the candid student must see, that the stream of consciousness is in fact even less real than the objects. States of consciousness, sensations, and their like are artificial constructions, the result of the scientific psychological analysis of experience, bearing little relation to the facts of life as directly known. In fact, philosophy, at last accounts, was still seeking for the "immediate data of experience," and in the writer's opinion it will still be seeking for them as long as the problems of thought have any challenge for the human mind.

Such being the result of the subjective, or psychological approach, it is next to be noted how similar have been the results of the objective, scientific study of reality, based on the naïve realism of the plain man, but otherwise submitted to the tests of the skeptical mind.

The attempt of science to find what is real in human behavior reduces it first to mechanical movements and physiological processes, in themselves sufficiently different from the "immediate" experience or observation of life. The rest is inference and emotion. But physiology just as inexorably dissolves into chemistry, and chemistry into physics, and all that physics leaves of reality is electric charges moving in fields of force — things far more unreal than the characters in the most fanciful work of fiction. Moreover, the experts in science and scientific method (*vide* Mach, Pearson, Russell) are frankly skeptical of the reality of any of it, and talk in terms of concepts useful for the purposes of analysis, and of the simplification of our thought processes.

The answer at the end of every line of inquiry is instrumentalism. Reality is not what is logical, but what it suits our *purposes* to treat as real. This was the upshot of the thought of Kant, the next great name in the history of philosophy after Hume; for, as Professor Fite has shown,<sup>9</sup> it was the great German thinker who made the transition from skepticism to pragmatism.<sup>1</sup> The logical study of "data," under which they always evaporate, has given place to the critical study of thought from a functional, that is purposive, point of view. Reality is the sum of the factors which condition purposive activity, including purposive thought, which must not be conceived of as always standing in an incidental relation to behavior.<sup>2</sup> The freeing of thought

9. Philosophical Review, 1914, p. 410.

1. This is true in spite of all the pedantry of Kant himself and of the absolutistic interpretations of his doctrine by his German followers down to Schopenhauer. Schopenhauer's voluntarism was eclipsed, and, for western taste, spoiled, by his pessimism.

2. This is the great weakness of the popular American brand of pragmatism. There is no reason for looking to any field of action or achievement to justify action or achievement in any other field; each one may and certainly does define its own values and provide its own ends, tho in a relation amounting to unity with all the others.

from emotion and metaphysical entities would mean its annihilation. It is impossible to perceive or imagine the real world without recognizing the equally real character both of purposes and of intellectual concepts. Thought is impossible without these non-factual data.

The real "Copernican Revolution" in thought was just this shift in viewpoint, the recognition of purpose as more fundamental than fact, and of observation as relative to use, or in any case relative to interest of some sort, and in some sense and some degree creative. For the essential character of purpose is its vital, dynamic quality; it is evolutionary; its nature is to grow cumulatively. When thought gives up the quest of reality in any other sense than experience organized in relation to some purpose, — which may be that of attaining more knowledge as well as any other use, — the two great departments of thought come to be history and criticism. The problem of ontology is merged, on the one hand, in the problem of genetics and on the other, in the problems of ideals and of ways and means. As shown above, to make the objects of scientific observation the only reality is merely to say dogmatically that scientific curiosity, thus narrowly defined arbitrarily, shall be the only legitimate interest in life. When the fact is faced that we have other interests, just as real, it is clear at once that scientific reality is subordinate to a wide field of purpose. Moreover, by scientific logic itself, purposes are real in so far as men agree in recognizing them as such, for that is what the scientific test of reality reduces to.

In the study of any phase of the problem the outstanding fact is the social nature alike of thought and achievement and of purpose itself. All are aspects of *social* evolution. The essence of association is communication. There can be no question that we build up our knowledge of an external world through the interchange

of experience with our fellow beings. The individual learns from others to perceive and observe, to interpret the "buzzing booming confusion" which experience in the raw must be (tho no one who can talk about experience has any immediate unsophisticated knowledge of what it is) into a world of objects, movements, relations, and forces. Thus observation itself, understood in anything approaching its scientific meaning, is a power socially developed and trained in the individual, and produced in the course of history by the accumulation of communicated and compared experiences. Only in this way do we learn even to see, with anything like accuracy. And always we see largely what we expect to see, what fits into our organized knowledge of the world. And the structure of our thinking is notoriously that of our language, our medium of communication.

So far from our knowledge of the consciousness of other persons being an "inference" from a "perception" of their behavior, it turns out that the very capacity to perceive is developed through and dependent upon intercommunication between minds as conscious centers. Knowledge of that which we say we infer is logically prior to knowledge of that which we say we observe, since it is a condition of observation itself. And always, the test for distinguishing "real" observation from imaginary is the possibility of verification, which means comparison with the communicated observations of other persons. Observation in the scientific sense is therefore restricted to the limits of possible communication; and nothing very far from the common experience of the race, accumulated and organized into concepts and symbolized by speech forms, could be observed even if it existed.<sup>3</sup> There is no such thing as either immediate

3. The common identification of "observed fact" with "sense data" is manifestly a confusion. The perception of an object rests upon ages of mental sophistication. Moreover, as we have previously remarked, no

or positive knowledge, it is all a matter of the relative cogency of reasons, or usefulness of believing one thing as compared with another. Scientific truth is a critical rather than a logical category.

## V

Further development of the argument in its philosophical bearings lies outside the purpose of this paper. These are worked out along what the writer considers the correct lines in the writings of Bergson and James.<sup>4</sup> The implications for economics may be pointed out under two headings, tho the issues are closely related. The first is the interpretation of wants as springs of action and agencies of control, or economics in its more scientific aspect. The second is the somewhat larger question of the fundamentals of social policy and economic organization.

Under the first head the essential point is that economics is a branch of esthetics and ethics to a larger extent than of mechanics. This of course implies that esthetics and ethics themselves are not to be reduced to economics, and by way of economics to behavior mechanics. The wants with which the economist is concerned in explaining the consumption and production of wealth are sharply distinguished both from desires as causes and from desires as effective stimuli to action. They have to be thought of and treated as much more than forces, conscious or unconscious, which dissolve into mere phenomenal uniformity of coexistence and sequence. On the one hand, desires have a primary, as-observation in the true sense is quite compulsory and unavoidable; no objectification will stand up under hard skeptical scrutiny; every perception of reality is more or less a voluntary act. Thought is saturated with purpose and concepts, emotion and metaphysical entities.

4. Dewey's position seems ambiguous to me; in so far as it is naturalistic and intellectualistic, I am out of sympathy with it, as I am also with any "idealism" of an absolutistic or monistic tendency.

sertive, creative, and experimental character; they are choices. On the other, they have a cognitive quality. The person choosing and acting has a feeling of laying hold on an external verity, closely akin to the peculiar "tang" of actual perception of objects as contrasted with dreaming or imagining — the quality which Hume called vividness. The motive of conduct is more or less a judgment of real worth as well as a conscious impulse to act; and this conscious impulse again is more than the bare fact that action follows stimulation in some determinate way. Scientific logic easily shows the feeling of objectivity in connection with value to be illusion and "mere emotion"; but the same process even more easily and surely makes illusion of our ordinary perceptions of external reality. So, the reflection is on scientific logic; for we cannot be absolute skeptics and live. Hence we come perforce around the circle. Observation cannot be freed from emotion; and values have to be conceded a degree of objectivity, and value of some sort a reality even prior to that of the data of sense-observation, which, for its part, always contains an emotional element.

It follows, as has been already suggested, that the method of social prediction and control is as closely akin to the method of art and of esthetic criticism as to the method of laboratory science. Economics has, of course, problems of both sorts, but the former are the more extensive and fundamental. The motives underlying economic behavior have no discoverable general and uniform relation to organic needs, even if these could be defined in purely objective terms, which cannot in fact be done. The identification of motive and need, or the reduction of actual human wants to biological terms, rests on assertion contrary to evident fact. Wants are culture products, to be judged by culture

canons and understood and controlled through culture categories. Even our food and clothing, in all their concrete content, and by far the larger part of their money cost, represent social and esthetic and not biological values. To a large extent, of course, the phenomena of culture are reducible to law in their own sphere, whether the behavior in question is conscious or unconscious. So also artistic production is in part the application of objective technique in the production of effects conceived and defined in advance. The part in either case that is based on deliberate creative choice can never be distinguished and measured. But it is the crucial part. One main objective in life is to get routine and repetitive activities down to the level of unconscious habit, or to relegate them to machines or slaves of some sort, and set one's own time and energies free for activities which involve originality, initiative, exploration, creation. It is always possible to assert that there is a mechanical law covering every detail of conduct if we could discover it,<sup>5</sup> but the assertion is mere dogma, and practical procedure calls for the opposite assumption.

Moreover, motives resist reduction to any common measure or principle in any terms simpler in their own kind than value itself. That motives in their vast variety are in some sense a manifestation of a "will to live," that all values may be evaluated in terms of

5. That is, it is possible to assert, and impossible to disprove either of these two propositions: (1) That conscious motives are mechanical forces merely, and axiomatically account exactly for conduct, or (2) the more rigorously positivistic view that motives, like all forces, are fictitious, and the sequence of physical changes the only reality. In practice, our contention is that it must be assumed *both* that force is more than phenomenal uniformity of sequence, *and* that human motives are more than mechanical forces. If the practical necessities of thinking and acting are regarded as indicating the nature of reality, — and they are the only indicators we finally have, — this amounts to a demonstration of some sort of philosophic idealism.

"quantity of life," has the appearance of an approach to scientific treatment, and is a common assertion of the scientific dogmatist. The notion is familiar in the classical literature of both orthodox and socialistic economic theory, and it is interesting to find thinkers so far apart as Herbert Spencer, John Ruskin, and Dr. Thorstein Veblen speaking essentially the same language at this point. Passing over again the evident fact that a "will" to live is more than the *fact* of living, or else is a mischievous use of words, we find it hard to tell what these writers mean by quantity of life, and perhaps harder to tell what they think they mean by its value. If number of individuals is the measure of life, as Professor Carver has courageously maintained, it would appear that insects or bacteria represent the "highest," the most successful, forms. The only other objective measure that suggests itself is the quantity of energy involved in the metabolic process and this standard would hardly yield a ranking in value which would meet with general acceptance. The word "adaptation" is freely used as if it represented something more objective and scientific than moral goodness as a conception of success in life; but the notion will not stand examination. It is, in fact, a good example of the substitution of sound for sense; it either looks back to the maintenance and increase of life and encounters the difficulties already suggested, or else looks forward to some esthetic or moral standard.

Marx, and Veblen following him, seem to have in mind some metaphysical "principle" of life, a concept belonging to the intuitive thought realms above such requirements as definition or measurement — and in the writer's opinion not devoid of significance if its "unscientific" character is recognized instead of asserting the contrary. Ruskin, even more clearly, really meant

simply value, conceived in aesthetic and moral terms. His famous dictum, "There is no wealth but life," therefore means merely that there is no value but value. This, too, in the connection and for the purpose of Ruskin's preaching, is anything but nonsense. It is exactly what our overscientifically minded students of social problems still need to be told, with all possible emphasis.

Life, *as life*, is no more a value than it is a quantity in the scientific sense. There is hardly a need for arguing about the value of mere physiological process, and hardly more need to point out that consciousness, as such, is not a value either. Everything depends on what kind of consciousness it is, its quality. No doubt life has to be poor and hard if it is not to be regarded as "better than none"; but to a negligible extent does the question of living or not living come up in practice. Thought and effort under all ordinary conditions take life for granted and are directed toward securing one kind of life rather than some other kind. And in the ultimate test, anaesthesia and euthanasia are chosen in preference to a conscious existence which is too far from the expectations and standards of the individual. Moreover, in the ordinary day's work, men constantly risk life, or knowingly shorten it, and in the last resort throw away a life by no means intolerable, for the chance of a "better" life, for themselves or for others. That human beings are by nature idealists and sentimentalist seems to be as incorrigibly and obstreperously a "fact," for practical purposes, as any verifiable scientific observation.

Space does not admit nor does the purpose of this paper require elaboration of philosophical implications beyond the main contention that the fruitful study of economic and social problems demands recognition of

*values* as data of a different character from factual observations in a uniform behavior sequence. Science itself is purposive, instrumental; and when it is intelligent and candid, it makes no pretences in regard to throwing light on the nature of ultimate reality. It treats of the data of experience from the standpoint of classification and analysis, because that is the most fruitful method for prediction and control in a large part of the field. It is not to be assumed without demonstration that the method is completely and universally applicable, even in a narrowly practical sense; and there is an inherent contradiction involved in applying it to purposive behavior as such. Science itself loses its meaning when the effort is made to lift the categorical distinction between purpose and the means of its fulfillment. Furthermore, is there anything more absurd intrinsically than the idea that thought and feeling minister to, and are justified by, their promotion of the physico-chemical process of metabolism? Measured by the ultimate test employed by science itself, the test of intelligent communicability, the higher values seem to have a claim to real existence as high as that of the data of observation, which are by no means immediately known, but are constructed by elaborate purposive inference and organization of "immediate sense-data," whose own existence is in fact hypothetical. Candid introspection shows that ends, purposes, cannot be described in the static type of categories used by science. Only in part do they fall into classes, or remain identical with themselves from moment to moment. Yet we can discuss them in their uniqueness and describe them in their growth and change. Our minds do have an apparatus of thought and communication different from that of scientific logic, and language is an instrument of this higher process as well as of the lower and more exact.

Economists have erred egregiously in assuming that behavior can be dealt with in objective, scientific terms alone, or that purpose, being recognized as in some sense real, can be handled with the same type of intellectual apparatus. The purposes of men are inherently dynamic and changing; want-satisfying activity is not in the main directed toward gratifying existing desires sharply defined as data in the conduct problem; it is largely explorative in character; a repetitive experience is looked upon more or less as a necessary evil and its motive as a goad rather than an end. The problem of human life is less that of getting preconceived results than of finding out the results of actions and acquiring "better" wants. We do things to prove that we can, and to find out whether we like to; the problem is largely to understand the problem itself, and as with smaller problems, understanding it largely carries the actual solution with it as a matter of course. The consumer and producer of wealth commonly does not realize it, but it is true that much of his activity is in response to the poetic injunction, "Know thyself." Curiosity is very largely synonymous with the supposedly broader term, "interest." Knowledge of self cannot be separated from knowledge of the world, nor either knowledge from that which is known. As we know more, both the self and the world are enlarged, and this growth is life.

## VI

The point of view developed above has direct significance also for the central practical problem of economic theory, which is that of evaluating competitive individualism as a system of social organization, in comparison with a system based upon conscious, intelligent coöperation and on moral motives in place of the mechanical interaction of self-seeking activities. The commonly

recognized function of economic organization is to utilize the limited resources at the command of the social group in bringing about the largest possible satisfaction of the wants of its members. But the form of organization also goes far to determine what is to be wanted, and to mold the attitudes of persons toward their work and toward each other. The main defence of the competitive system against an increasing volume of criticism has rested upon its efficiency, and the candid student must probably concede its superiority on that score. True, that efficiency itself is disappointingly low. As measured by the most objective standards attainable, the results can hardly be more than a third of those theoretically possible with existing material resources and technical knowledge, and are probably well below that figure. But in recent years thoughtful opinion has been tending to place less emphasis on efficiency in achieving objectives taken for granted, and to give increasing recognition and weight to this other question of the type of objective generated and the general philosophy of life inculcated in people.

The World War and its aftermath have greatly accentuated this shift in emphasis and change in standards of judgment. Critical attention has been focussed, not merely on the glaring discrepancy between the actual principles of social action and the ethical-religious pretensions of Western civilization, but also on the practical consequences which follow from the Machiavellian-Mandevillian standards which make intelligent selfishness equivalent to virtue, and power and cunning the main components of our human ideal. The values which animate our economic activity are being made explicit and subjected to critical scrutiny as has not been done before since the industrial era began. People in high places are coming to feel that much of our toil and

trouble serves no end but to feed the increasing fires of competitive display and greed of power, and are asking whether life has to be a relentless struggle for distinction and domination, or whether a bit more of friendliness might not be worth some sacrifice, if necessary, of the touted physical ease and comfort which few get and fewer have time to enjoy. There is more willingness to envisage a world presenting less "progress" toward goals which seem dubious, and a lower rate of consumption of "goods and services" whose connection with goodness and serviceability is not always clear.

This does *not* mean, as some have too hastily inferred, that the economic system is to be criticized because it manufactures our wants, or because it charges as much for making them as for gratifying them, or even more. *That would be true in any social system, and desirable.* The development of wants is really much more important than their satisfaction; there is no poverty so deplorable as poverty of interests. There is no issue as between "natural" wants and "artificial"; all human wants are more artificial than natural, and the expression natural wants, if it has any meaning, can refer only to those of beasts. By the same token, human wants are more "sentimental" than "real." The issue is between artificial sentimental wants which are good and artificial sentimental wants which are bad. This is especially true as we come to realize that standards of living and of work are largely but reflected desires for one type or another of human relationship, that we want things, mainly to be like others or to be different from them, to emulate or dominate, be agreeable or arouse envy, and so on. It may be ever so demonstrable that competition is really but a method of coöperation, and even a very "good" method as far as effectiveness and low organization cost go; and it yet may be far more important that

competition teaches men to *think* of each other as competitors and not as co-workers, and to *see* their relation to their work as that of the slave to his treadmill. The incentives to work may have value significance as well as the results. It is even beginning to be asked whether it is really inevitable, and in that sense right, that in a vast social coöperation the "superior" individuals (meaning the more powerful) must be paid for their superiority, and for the interesting creative and directive work which must admittedly fall to the superior, by being given as a matter of course vastly more than an equal share of the inadequate product of the joint enterprise. Even the mechanical efficacy of "material" rewards in calling out the most and best that men have to give is being questioned, as it is more clearly perceived that the actual incentive is not really material in the main, but social and sentimental and far removed from the love of comfort and ease.

These considerations are mentioned to indicate the basis on which the competitive system is to be judged, not to pass judgment upon it. "There is much to be said on both sides." At most, argument can only point out the direction of progress, not draw the specifications for revolutionary transformation. And aside from the fact that there are limits, regrettably narrow, to the possible sacrifice of efficiency, and assuming that a social order not based fundamentally on self-interest can be made to function, it must be observed in addition that the moral issues are not all one-sided. Commercialism has certainly been a powerful agency in the development of tolerance. The strength and self-reliance which it emphasizes must always have a prominent place in the ideal character. Moreover, it is uncertain how far the unfortunate attitudes of people toward each other and toward their work are really due to any particular sys-

tem of organization, and how far they are incidental to large-scale coöperation as such, irrespective of the type of mechanism which controls the distribution of burdens and benefits. The aim of the later sections of the present paper has been merely to develop a point of view from which intelligent judgment of the question is possible. That point of view may be summed up in the paraphrase already proposed of Ruskin's famous dictum: "There is no Value but Value." The necessity for a thoroggoing acceptance of this point of view has been established by an examination of the perplexities of economic methodology.

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## THE TAXATION OF UNIMPROVED VALUE OF LAND IN AUSTRALIA

### SUMMARY

Spread of taxes on unimproved land in the States and in the Commonwealth from 1884 to 1910. — Three chief aims: revenue, tapping the unearned increment, breaking up of big estates, 411. — The last-named the chief aim of the Federal tax, 415. — Extent and importance of the big estates, 415. — The Federal land tax of 1910, 421. — The battles in the law courts, 424. — The problem of valuation, 428. — No spectacular results: some redistribution of land, 434. — Absentee landowners reduced their holdings about one half, 437. — Who bought, 440. — The problem of finding land for new settlers almost as difficult as ever, 447.

TAXATION of the unimproved value of Australian land began in South Australia in 1884. Other states were slow to follow this example, partly because public revenue was plentiful, and partly because of the powerful opposition of the large land-owning interests in the various upper houses. But eventually the financial difficulties caused by the depression of the nineties, the propaganda of the Single-Taxers, the rise to political power of the Labor Party, and the growing "menace" of the big estates, compelled state after state to impose taxes on unimproved value.<sup>1</sup> Then, in addition, most of the states gave the local authorities — municipal, district, and shire — power to levy rates on the unimproved value of land. In Queensland all rates are assessed on that basis;<sup>2</sup> in New South Wales the local councils obtain most of their revenue in the same way, and the state government does not levy land tax on

1. New South Wales in 1895, Western Australia in 1907, Tasmania and Victoria in 1910, Queensland in 1915. Some states had taxes on the annual value of the land long before they adopted the new basis.

2. This system of rating was established in 1890, but a state tax was not imposed till 1915.

areas subject to this form of local rating. In the other mainland states the local authorities may, if they wish and the rate-payers agree,<sup>3</sup> change their rating basis from the annual value of land, buildings, etc., to the unimproved capital value of land. Finally, in 1910, the Commonwealth (that is, Federal) Parliament imposed a Federal land tax. Australia has thus had, in some parts, about thirty years of state or local land taxation, and for thirteen years landowners may have been paying three imposts — to the local rate collector, the State Treasury, and the Federal coffers.

#### AIMS

Three chief reasons for taxing unimproved value can be discerned. (1) The need for more revenue and for new sources of public income; (2) The desire to secure for the community some of the "unearned increment" of land; (3) The desire to break up big estates and to bring idle or under-utilized land into better use.

##### (1) *The Need for Revenue*

While the case for unimproved values taxation might be admitted, usually some pressing financial stringency was needed to make a parliament impose the tax. South Australia in the eighteen-eighties and New South Wales in the nineties introduced income tax and land tax together, in order to meet a deficit caused by a depression or to compensate the Treasurer for the loss of revenue caused by a reduction of customs tariff rates. The local authorities were given power to levy the unimproved values rate because the state governments wished to be freed from paying such large subsidies to the local coun-

3. Usually a referendum must be taken, and at least a certain proportion of the rate-payers must cast their votes. For a detailed study of Australian taxation of land values up to about 1910, see Scheftel, *The Taxation of Land Value* (Houghton Mifflin Co., 1916), chaps. 2 and 3.

cils as had been paid in the early days of local government. Even the Federal land tax was in part due to the desire for more revenue. The Labor Party had come into power determined to establish old-age and invalid pensions, maternity allowances, and an Australian Navy, and needing money for the construction of trans-continental lines and the development of the Northern Territory. The pensions and maternity allowance required nearly £3,000,000 per annum, while the new defense plans cost at first nearly £2,000,000 yearly. To meet this growing outlay, the customs and excise charges, which until 1910 were the only source of Federal tax revenue, were inadequate. One or two millions from the hated big landowner would therefore be useful.

In practice the yield from the various land taxes has not been very large or important except in the case of the local rates of Queensland and New South Wales. In most states the rate of state land tax has been so low that the revenue derived therefrom has been small.<sup>4</sup> In 1916 the land tax revenue in all the six states amounted to only about £1,000,000; in 1920 it was £1,119,000.<sup>5</sup> As the total revenue from state taxation in 1920 was over £18,000,000, it will be seen that the land tax is a comparatively unimportant part of the states' fiscal system. The Federal land tax in 1911-12 provided £1,367,000 out of a total tax yield of £14,347,000, that is, 9.5 per cent. In the first year of the war the yield was increased by raising the rate about 30 per cent, and by extending the scope of the tax to cover crown leaseholds. In 1918 the rate was lifted a further 20 per cent. The yield for the last six years has therefore been over

4. In South Australia,  $\frac{1}{2}$ d. in the pound up to £5,000, 1d. above £5,000, with 20 per cent extra for absentees; New South Wales, 1d.; Victoria,  $\frac{1}{2}$ d.; Tasmania, 1d., rising at £80,000 to 2 $\frac{1}{2}$ d.; West Australia, 1d., and 1 $\frac{1}{2}$ d. for absentees. Queensland alone has high rates, ranging from 1d. up to 6d., with an additional tax of 2d. on undeveloped land.

5. Commonwealth Year-Book No. 15, p. 582.

£2,000,000 per annum. But as the Federal Government tapped other new sources of revenue during the war period, the land tax supplies only about 4 per cent of the total tax income.

(2) "*Tapping the Unearned Increment*"

In new and growing communities, especially urban centres, growth in the unimproved value of land is often rapid and great. The expansion of production and trade, the call for shopping centres, subdivision of sub-urban lands, facilities for the purchase of homes by instalments, road-making, land speculation, and the many other factors which contribute to the growth of an Australian town, cause the value of all sites to increase at a pace unknown in older communities.<sup>6</sup> For instance, the assessed unimproved value of the land in the city of Sydney rose from £20,208,000 in 1905 to £31,169,000 in 1916, or 54 per cent; that of the New South Wales municipalities outside Sydney increased from £33,344,000 in 1901 to £58,098,000 in 1916, or 74 per cent; that of the shires — which included the agricultural and pastoral lands of the middle and eastern areas — rose from £81,500,000 to £105,700,000, or 30 per cent.<sup>7</sup> Australia had read its John Stuart Mill long before it knew of Henry George,<sup>8</sup> and it was natural that

6. Building blocks in a seaside suburb of Adelaide have been known to double in value within five years. In some of the main shopping streets of Australian capitals, land with a depth of not more than 100 feet has sold at £1,000 per foot of frontage.

7. Knibbs, *Local Government in Australia* (1919), pp. 23, 15, 17. It is common knowledge that the assessments of the local bodies err in being too low, rather than too high, so the growth of unimproved value was certainly greater than indicated above. On the other hand, there was some increase in the area under local government.

8. Henry George's influence was considerable. A leading Sydney paper published his *Progress and Poverty* in serial form, and George's visit to Australia about 1890 aroused much interest. Even to-day many prominent members of the Labor Party admit in private conversation that they are really at heart free traders and single-taxers.

a system of rating should be sought which would give the local authorities some of the increment indicated above. The state land taxes also endeavored to tax some of this "unearned increment." Country land advanced in value with the construction of railways, roads, water services, etc., by the state. But since most of the alienated land had been obtained for a low price, the owner obtained the whole benefit of the increased unimproved value of his land without paying anything except in his capacity as a general taxpayer. Crown leaseholders might contribute a little to the state coffers by having their rent raised periodically: but the freeholder escaped all such liability and must therefore return to the community some of the "socially created" value of his land by paying land tax.

### (3) *Breaking up the Big Estates*

The desire to break up, or to bring into better use, large holdings of land was one aim, but probably a subsidiary aim, of the local rates and the state land taxes. Men who held idle land in city or suburb, waiting to sell at a high price, were to be hit so hard as to compel them to sell their holdings and thus facilitate building operations. The land speculator of this type is a well-known figure in every Australian city, and a municipal rate levied on the basis of the annual rental value of an idle block of land is so small that he can afford to pay it without serious injury. But once his rates are assessed on the basis of the unimproved value of the land, the payment may become very heavy, and he will therefore be willing to sell at a lower price than otherwise in order to escape the impost. In practice, however, the local rates and the state land taxes have been too low to produce any great result except in places where a man might hold very large blocks, say, of several acres, of suburban land.

With the Federal land tax, however, the chief social aim was to break up or bring into the fullest possible use the big under-utilized estates of the continent. As such, the tax tried to solve a problem which has worried Australian public men for at least sixty years.

#### EXTENT AND IMPORTANCE OF THE BIG ESTATES

The Australian big estate is the product of historical as well as of geographical and climatic conditions. The early land grants created some big freeholds, and as early as 1836 we find a Hobart journalist talking of the "ten and twenty thousand acre gentlemen," the "Antipodean Princes."<sup>9</sup> The squatters who, during the eighteen-thirties and forties occupied big areas often bought the "eves," that is, the water-holes, river frontages, etc., of their leases, and thus made the surrounding land useless to anyone but themselves. Hence, when the immigrants and goldminers turned in the eighteen-fifties and sixties to seek for farms, the best or most accessible areas were found to be either freehold or locked up in large pastoral holdings. In the fight between squatter and settler which followed, the state endeavored to help the settler, hoping thus to build up a race of "sturdy yeomen." But legislative and administrative efforts achieved little. Alienation of land in small holdings went on apace, but under some strange adaptation of Gresham's Law the big holdings drove out the small ones. Settlement and cultivation advanced at a snail's pace, and between 1861 and 1884 the sale of 39,000,000 acres in New South Wales resulted in the settlement of only 21,000 new holdings and the cultivation of an addi-

9. Henry Melville, *History of Van Diemen's Land* (Hobart, 1836), p. 151. Melville advocated that all the crown revenue should be raised by a tax on land, and was thus probably the first single-taxer in the country.

tional 420,000 acres.<sup>1</sup> In the other states similar developments took place: Victoria by 1877 was feeling effects of the wasteful alienation of land and the consequent scarcity of areas fit for closer settlement, while in South Australia 539 persons in 1891 held two fifths of the total alienated area, in blocks of over 5,000 acres.<sup>2</sup> Of the land held in big estates in South Australia, probably half was fit for agriculture; and here, as in the other colonies, large estates were used as sheep runs inside the fertile areas now easily accessible by road and rail.<sup>3</sup>

By 1890 the failure of existing legislation to promote close settlement was generally admitted throughout the continent. New avenues of production were being opened — thanks to irrigation and improving refrigeration — for dairy-farming, mixed farming, and orcharding, while the use of superphosphates and of dry-farming methods had turned into possible wheat fields large areas of low rainfall in the southern parts of the continent. Hence new lines of policy were adopted. On the one hand governments endeavored to exercise much greater caution in the further alienation of crown lands, hoping thereby to cover the countryside with farms which were big enough, if used for the purpose for which they were best fitted, to maintain in average seasons and circumstances an average family. On the other hand, governments began to buy back land already alienated and to cut it up into blocks of suitable size for

1. Coghlan, *Labour and Industry in Australia*, p. 1362. For a detailed treatment of this topic, see article by present writer in *Australia: Economic and Political Studies*, ed. M. Atkinson (1920), chap. 9.

2. Coghlan, *op. cit.*, p. 1393.

3. E. g., an estate of 70,000 acres 50 miles from Adelaide, with good rich soil, and an 18- to 20-inch rainfall; a 43,000 acre estate 90 miles from Adelaide, with a 17-inch rainfall; an 84,000 acre run, 91 miles from Adelaide, with a 15- to 22-inch rainfall. Similar instances could be quoted in every state.

resale. In all, about 2,600,000 acres had been repurchased for closer settlement by 1911. But neither careful alienation nor vigorous resumption seemed to produce satisfactory results. The alienated land still went out of the hands of the small man into larger estates. The resumed areas sometimes proved to be unfit for closer settlement, and the price which the settler had to pay in order to cover the cost of resumption, survey, and subdivision, was often so high that hard work yielded little net profit.

By 1910 it was evident that Australia was progressing far too slowly with the settlement of a big rural population. The total net immigration for the first ten years of the century had been only 40,000, and Victoria had lost 50,000 by emigration to other states or countries. The total population had increased by only a million in sixteen years, despite the fact that during that period 40,000,000 acres had been disposed of to buyers and at least 100,000,000 acres to lessees, and a generous Federal tariff had been erected to encourage manufacturing industries. Between the censuses of 1901 and 1911 the population of Australia grew 18 per cent, and the number of persons engaged in factories and workshops 58 per cent. But the number of people occupied in agricultural pursuits rose less than 4 per cent, the number in pastoral pursuits 36 per cent. Twenty years of experimental land legislation, resumption, immigration, etc., had given New South Wales 5,000 more agriculturists, Victoria 1,000 more, and Queensland 200 less, in 1911 than in 1891.<sup>4</sup> The number of pastoral workers in Australia doubled between those two years; the number of cultivators rose only 15 per cent. The production statistics make a braver show, for between 1901 and 1911

4. The figures in these paragraphs are compiled from the Commonwealth Year-Book, chapter on Land Tenure and Settlement, and the 1911 Census reports on Occupations.

the area under crop rose 35 per cent, the amount of wheat produced nearly doubled, while the number of sheep and cattle increased by roughly one third. Better farming methods, the use of superphosphates, the introduction of better machinery, and the recovery of prices of farm products, all had their effect; but when we remember that of the 500,000 square miles said to be suitable for wheat only about 35,000 were being used for that purpose in 1910-11, it will be realized that much land capable of carrying a farming population was being used for sheep or cattle.

What was the cause of this snail-like progress of agricultural settlement? Was it lack of transport facilities, of capital, labor, energy, or markets? Or was it that pastoral work gave the least trouble and made the greatest net return? The politician's answer was that the large estate was the enemy of progress. This belief was naturally held by the Labor Party, but was shared by many prominent opponents of political Labor, such as Messrs. Deakin, Watt, and Cook. Mr. Deakin, in his twenty years' advocacy of irrigation, immigration, and closer settlement, had soon realized that big pastoral estates in the arable areas must be broken up, and had therefore always been a supporter of land taxation,<sup>5</sup> while Mr. Watt was the father of the Victorian land tax on unimproved value. In fact, nearly every public man who had attempted to foster immigration and accelerate rural development had come into collision with the big freehold sheep runs.

Australian statistics on land tenure are sufficiently detailed to show the extent of the big-estate problem. If we take the crude test of area, we find that in 1910 there were the following estates, alienated or in process

5. Federal Hansard, 1910 session, p. 2208. "I have always been a State land taxpayer."

of alienation, in the Commonwealth, Queensland excluded: <sup>6</sup>

111 estates over 50,000 acres.....	Area 10,175,000 acres
382    20,001 to 50,000 .....	11,335,000
659    10,001 to 20,000 .....	9,085,000
<hr/> 1,152	<hr/> 30,595,000

The total number of holdings of one acre or over at that time was about 210,000, and the total area of these holdings was 107,100,000 acres. Therefore those owning over 10,000 acres amounted to one half of one per cent of the total owners, and they had in their hands 29 per cent of the alienated area. In New South Wales the number of estates over 10,000 acres had grown from 414 in 1880 <sup>7</sup> to 703 in 1910; and altho the holdings of over 50,000 acres had dropped in number from 149 to 99 between 1901 and 1910 the 20,000 to 50,000 estates had grown rapidly in number during that period. In the other states, the number of estates over 10,000 acres was not growing much, and the holdings of 50,000 acres or over were slowly disappearing. The spread of dairy-farming and the fear of land tax were probably responsible for this. But in the opinion of many people, the big estate was holding its own too stubbornly, and with less than 1,200 people in possession of nearly 30 per cent of the alienated land the land taxer had a big, easy political target.

Often the big freeholder held leasehold lands as well. In 1914-15 two Federal land-taxpayers held 19,650,000 acres between them on this mixed tenure. In the following year, a company held under freehold or conditional

6. Compiled from Commonwealth Year-Book and Statistical Register of the States. No figures are available for Queensland.

7. Coghlan, *Wealth and Progress of New South Wales, 1886-87*, p. 204.

purchase nearly 1,400,000 acres, and under crown leasehold 3,420,000 acres.<sup>8</sup>

Turning from the test of area to that of unimproved value, we get from the annual reports of the Federal Land Tax Commissioner material regarding the distribution of wealth in land. In 1913-14, the first year for which "final" figures are given, 13,842 residents paid Federal land tax by virtue of owning land worth over £5,000 unimproved value; 3,627 absentees owned land.<sup>9</sup> Residents were exempted from taxation on the first £5,000 unimproved value, but absentees enjoyed no exemption whatever. The 17,469 taxpayers were distributed as follows on the basis of taxable balance:

Taxable balance (U. V.)	No. of taxpayers.
£ 1 to £10,000.....	13,710
£ 10,001 to £50,000.....	3,198
£ 50,001 to £100,000.....	407
£100,001 to £200,000.....	112
over £200,000.....	42

Of the 42 in the highest grade, six paid tax on over £500,000, and one on over £1,000,000. Since the improved value of land can safely be estimated at 75 to 90 per cent more than the unimproved value, we shall not err in regarding estates which paid tax on over £50,000 as big holdings. There were, therefore, 561 big landowners in 1913, and their estates contained 31 per cent of the area of country land subject to tax and 25 per cent of its unimproved value.<sup>1</sup>

8. Federal Land Tax Commissioner's Report, vol. vi, p. 10 and vol. vii, p. 41.

9. Commissioner's Report, vol. v, schedule 10. By this time the Federal land tax had been in operation for three years and had caused the subdivision of many taxable estates. Hence big estates were more numerous in 1910 than in 1913.

1. Report, vol. v, p. 50. Some holdings went over the £2,000,000 U. V. mark. The company referred to in the previous paragraph had land worth £2,135,000 U. V. Report, vol. vii, p. 41.

The land held by these big taxpayers was sometimes poor; but much of it was evidently good, and had an average unimproved value often equal to that of smaller estates and equal to the average unimproved value of all the taxed country land. The position can be seen from the following table of average unimproved value of country land held by residents in various taxable grades in 1910.

Taxable grade		Average U. V. of land in grade		
All taxable country land		£ 1 19 0 an acre		
		£	s	d
£	1 to 1,000.....	2	3	0
	1,001 to 2,000.....	1	18	0
	2,001 to 3,000.....	2	3	0
	120,001 to 130,000.....	3	18	0
	140,001 to 150,000.....	3	19	6
	160,001 to 170,000.....	3	5	0
	300,001 to 350,000.....		5	0
	450,001 to 500,000.....	1	7	0
	Above 500,000.....	2	3	0

The average unimproved value of all country land in estates of over £50,000 taxable value was £1.16 an acre;<sup>2</sup> so obviously the big men's holdings were not desert. Years before, the squatters on the Darling Downs (in southern Queensland) had declared vehemently that their land was unfit for anything but large pastoral runs; but the subsequent closer settlement of that area had given them the lie. What had happened on the Downs could happen in many other places.

#### THE FEDERAL LAND TAX, 1910

To "burst up" these big holdings, to bring the land into better use or into the market, was one of the chief planks of the Labor platform at the Federal election of 1910, and victory at the polls made possible the passage

2. Compiled from Report, vol. iv, pp. 34, 35. To get the actual U. V. of each grade, add £5,000 to the grade figures.

of the necessary legislation by November, 1910. The Governor-General's speech declared that "in view of the urgent necessity for encouraging an influx of suitable immigrants . . . in order to more effectively develop [Australia's] great resources and defend it against possible invasion," a policy would be adopted "which, it is confidently believed, will, by making fertile land available, speedily induce very large numbers of people of the right kind to settle on the lands of the Commonwealth." In the prolonged debates which followed, such utterances as the following were heard: "We know that the best lands are locked up and are not giving their full value to the nation." "We want the land to be made available." "One of our great hopes is that [the tax] will convert the large areas into smaller ones." "The object is closer settlement." "I hope and believe that the tax will be heavy enough to make sufficient land available for settlers." "If anything has to be sent to the backblocks, let it be the sheep, so that human beings may occupy the better places." "The tax will largely put an end to land monopoly, will check the aggregation of great estates, and enormously facilitate settlement on the land."

The old land-hunger, with 1,200 applicants for 80 mallee country blocks,<sup>3</sup> or with 700 applicants for a single block in New South Wales,<sup>4</sup> was to be satisfied at last; and not only would the Australian be able to get land, but the tide of immigration would at last rise high. "There will be an influx which will be an object lesson to the world," said one Senator,<sup>5</sup> and Mr. Hughes

3. Federal Hansard, 1910 session, p. 2320. A case quoted by one member of the House of Representatives. Mallee land is land of light rainfall, suitable for dry farming. Before being cleared, it is covered with scrub called mallee.

4. *Ibid.*, p. 179.

5. Federal Hansard, p. 74.

declared that through the operation of the tax there would be "land for the people, and where there is land there will the people come. . . . There will not be lacking guests to sit at the table." <sup>6</sup>

Unfortunately for the land reformer, the Federal Parliament has no power to touch land legislation or questions of tenure, and its only weapon for carving up the big estates was a tax. A progressive tax was therefore imposed on all residents' estates worth over £5,000 U. V.,<sup>7</sup> and on all land owned by absentees. For residents the rate began at £5,001, at one penny on the first taxable pound of unimproved value, and rose by  $\frac{1}{30,000}$  of a penny for each pound up to £75,000 of taxable balance. By this time it stood at 3½*d.* over the whole £75,000, and a flat rate of 6*d.* was imposed on all taxable balance above that amount.<sup>8</sup> For absentees the rate was a penny higher all through. Companies were regarded as residents, even tho their shareholders might be absentees. Elaborate and complicated provisions were made to deal with partnerships, trust estates, life tenants, etc., and the act therefore bristled with technical difficulties.<sup>9</sup>

In its original form the land tax applied only to land alienated, or nearly so, and to such virtual freeholds as (a) leases with right of purchase, and (b) perpetual crown leases over which the state had not retained the power to revalue the lease or revise the rent. But in 1914 all other forms of crown leasehold — perpetual,

6. *Ibid.*, p. 2225.

7. No state land-tax Act allowed so large an exemption. Tasmania and South Australia allowed no exemption. In the other states the exemption is: New South Wales, £240; Victoria, £250; Queensland, £300; West Australia, £150.

8. In practice half the tax assessed to residents was paid by 2 per cent of the resident taxpayers. Report, vol. iii, pp. 35-37.

9. For a detailed comparison of the State and Federal land taxes, see Commonwealth Year-Book, No. 14, pp. 732 ff.

with right of revaluation, pastoral, grazing, cultivation, homestead, mining, and timber — were brought into the tax field, thus increasing the area on which tax had to be assessed from about 70,000,000 acres to 360,000,000.<sup>1</sup> All landholders, whether owners or crown lessees, now became subject to tax, unless the unimproved value of their land was below £5,000.

#### THE BATTLES IN THE LAW COURTS

The Federal tax struck hard at the big holder, who might, especially after the rate was increased in 1914 and 1918, be paying up to 5 per cent<sup>2</sup> on the unimproved capital value of his estate to state, local, and Federal coffers. Hence there began a bitter struggle between the big landed interests and the Federal Commissioner of Land Tax, a struggle with many phases, and with the victory going now to one side, now to the other.

The first fight began with an attempt to induce the High Court to declare that the Federal Parliament had no power to pass a land-tax act.<sup>3</sup> In a test case it was urged that the tax was really an indirect attempt to control land tenure and regulate landownership. Its end was not to raise revenue, but to "prevent persons resident in the Commonwealth from holding and owning large areas of land, and to prevent persons not resident in the Commonwealth from holding and owning land." As such, it interfered with a branch of govern-

1. In the same year, the rate was raised by altering the fraction  $1/30,000$  to  $1/18,750$ , with a flat rate of 9d. beyond £75,000 taxable balance.

2. On £200,000 the Federal tax in 1923 was £6,062; in Queensland the State tax took another £4,470, to say nothing of local rates. Thus the very big Queensland owner might be paying an annual capital levy of 5½ per cent on the U. V. of his land. In South Australia the State and Federal tax on £200,000 was £6,900.

3. *Osborne vs. Commonwealth and Federal Land Tax Commissioner*. See Report, vol. i, pp. 26 ff.

ment — land tenure — which was distinctly a domestic affair of the states and was by the Federal Constitution reserved to them. On any foundation of fact or history, this plea was sound. The tax was a means, not an end in itself; every page of the Hansard reports proved that; Labor members had often declared that the Federal Parliament was fighting the big estates because the state governments would not do so; and the Commissioner's reports have always dealt at length with the effect of the tax in producing subdivision of large holdings.<sup>4</sup> But the High Court, blind to motives and unconcerned with such irrelevant matters as the possible indirect results of a tax, held the law to be valid.

When the tax was extended to crown leaseholds in 1914, the lessees joined hands and, supported by the Queensland government, endeavored to have the extension declared invalid, since, *inter alia*, it taxed state property. The High Court rejected the appeal, so the lessees applied to the Privy Council for special leave to appeal, but without success.<sup>5</sup> Defeated in the courts, the interests affected brought the matter strongly and directly before the Federal government, and attacked the Commissioner's valuations of leaseholds as "absolutely farcical" and preposterously high.<sup>6</sup> Mr. Watt, who was now in charge of the Treasury, thereupon appointed a royal commission to investigate the whole problem of taxation of crown leaseholds, and meanwhile verbally instructed the Commissioner to suspend collec-

4. E. g., Report, vol. vi, p. 5; here the Commissioner, after giving tables showing (1) the number of taxpayers, (2) the amount paid, (3) the total U. V., (4) the U. V. of land which had passed out of the taxable field, says that Table 4 "is the most significant column" of all, "as it affords an indication as to whether the land tax is achieving the object for which it was imposed, viz., the subdivision of large holdings."

5. Report, vol. v, p. 10, and vol. iv, pp. 132 ff.

6. Speech by Chairman of Australian Estates and Mortgage Co., London; in *Economist*, October 5, 1918, pp. 426 f. Also Report, vol. vii, p. 11.

tion of tax from crown lessees. The Royal Commission reported that altho sometimes the Commissioner's valuation had been unduly high, those submitted by the lessees were unduly low; it declared that the tax on leaseholds was not more, but rather less burdensome than that on freeholds, and decided in favor of the retention of the tax.<sup>7</sup> Altho this report was made in 1919, and altho a subsequent royal commission on Federal taxation in 1923 confirmed these findings, the tax on lessees remained suspended, with £2,000,000 outstanding. In 1923 the tax on leaseholds was abolished.<sup>8</sup>

The second struggle, or series of struggles, was on questions of interpretation; a third was on problems of valuation. On these two issues nearly fifty High Court cases, often protracted and expensive, were fought between 1910 and 1920, to say nothing of appeals to state courts and thousands of objections made to the department. Parliament had recognized that attempts would be made to minimize the amount of tax payable, by nominally subdividing large estates and transferring, by gift or sale, portions of them to members of the family, relatives, or others, while really keeping the control of the whole estate and its income in the hands of the original owner. Therefore land transferred by husband to wife, or *vice versa*, after the passage of the act was to be regarded as a joint interest, and not entitled to separate assessment and two separate deductions of £5,000, unless the Commissioner was satisfied that the transfer was not for the purpose of evading taxation. Agreements for sale of land were not to be recognized unless the buyer had taken actual possession

7. Report of Royal Commission on Taxation of Crown Leaseholds, Parl. Papers 1917-19 session, vol. 6, pp. 1027 ff. Also 4th report of Royal Commission on Taxation, pp. 189 ff.

8. This repeal can be explained only as a victory of politics and vested interests over equity.

of the land and paid 15 per cent of the purchase money, or the vendor had satisfied the Commissioner that the sale had been in good faith and not in order to evade tax. Landowners who transferred land to dependents and others, and then still continued to use, occupy, and control it without the sanction of a written lease, were checkmated by being regarded as lessees for life, and were therefore liable to taxation almost as heavily as if they were owners;<sup>9</sup> and a person leasing land of which, within the previous five years, he had been the owner, was assessed as if he still held the fee simple. Joint owners were, by an amendment in 1912, to be assessed as if their land belonged to one person, and this rule applied to all land held in partnership and that held, under wills, by trustees for beneficiaries, provided the will or settlement did not antedate the act.<sup>1</sup> But such provisions could not be generally retrospective, and therefore estates under settlements made before July 1, 1910 were given certain concessions, allowing each immediate beneficiary an exemption up to £5,000 on his share of the trust estate, instead of only one exemption for the whole property.

On these comprehensive and complicated clauses many lengthy battles were fought. Of 36 appeals to the High Court the Commissioner won 20, the taxpayer won 16, and almost every conceivable aspect of joint ownership passed under survey and fine judicial decree. The landowners' greatest triumph was the judicial ruling that the clause dealing with transfers from husband to wife was invalid, since the relations of husband and wife, as well as conditions of land transfer, were matters left by the constitution to the states.<sup>2</sup> The Commissioner met this verdict with the lament that it "leaves the

9. Land Tax Assessment (Amending) Act 37, of 1912, section 11.

1. Land Tax Assessment Act, 1910-14, sections 27, 38, and 38a.

2. Report, vol. iii, p. 57.

Department open to lose revenue to a considerable extent. Whilst in law a husband and wife may separately own land, in fact there is a community of interest in all their land, unless husband and wife are judicially separated."<sup>3</sup>

#### VALUATION

The struggle over valuation problems was general and prolonged. Even as late as 1917, the Commissioner was complaining that "notwithstanding repeated warnings in the press, many cases were discovered of persons who had never made returns, altho liable to do so, or who had persistently omitted from their returns certain lands owned by them."<sup>4</sup> When returns were received, the Commissioner decided in most cases that the values stated therein could not be accepted without check. The value returned might be based either on the owner's estimate of the unimproved value of his estate, or on the value fixed for local and state assessments. Both were questioned; the owner's estimate was naturally suspect; the shire official valuations were said to be too low, for "the landowning class is often directly represented on shire councils, and there is a tendency on the part of bodies so constituted to limit the values and the consequent tax for local government purposes."<sup>5</sup> State valuations could not be accepted without question, since the whole basis of valuation differed from state to state, lands of similar productiveness had widely differing values in adjacent states, and the definition of unimproved value was different from that of the Commonwealth in every instance.

3. Report, vol. iv, p. 87.

4. Report, vol. v, p. 5. In earlier reports complaints are made of "continued laxity" and of response "neither prompt nor complete." Reminders sent to many owners had been ignored, and legal proceedings threatened, before information was forthcoming.

5. Report, vol. i, p. 10.

The Federal Land Tax Department had, therefore, to face the task of ascertaining for itself the unimproved value of a continent. In the first five years 54,000,000 acres were valued, and the next four years were occupied in a survey of the newly-taxed crown leaseholds. By 1921, 617,000,000 acres had been subjected to departmental check valuations, that is, about half the total occupied area of the Commonwealth.<sup>6</sup> In this work the department was guided by three definitions embodied in the act. *Improved value* was defined as "the capital sum which the fee simple of the land might be expected to realize if offered for sale on such reasonable terms and conditions as a *bona fide* seller would require." The definition of *unimproved value* was obtained by adding to the above definition the words "assuming that the improvements, if any, thereon or appertaining thereto and made or acquired by the owner or his predecessor in title, had not been made." *Value of improvements* means "the added value which the improvements give to the land at the date of valuation, irrespective of the cost of the improvements,"<sup>7</sup> but the added value shall in no case exceed the amount that would reasonably be involved in bringing the unimproved value of the land to its improved value at the date of assessment. The unimproved value is therefore obtained by subtracting the value added by the improvements from the price a hypothetical wide-awake buyer would be willing to give and a *bona fide* seller — that is, one willing but not over-anxious to sell — would accept.

The hypothetical element in the statutory definitions opened the way for assessing values which might have no relation to any actual sales or to the use to which the land was being put. The former was especially the case

6. Report, vol. v, p. 17 and vol. vii, pp. 19, 20.

7. Land Tax Assessment Act, 1910-14, definitions.

in areas far back, where all land was held on leasehold and no actual freehold unimproved value or sale of freehold was known.<sup>8</sup> For these and other regions the Commissioner laid down, and the High Court generally endorsed, certain principles to guide the valuers. Of these, perhaps the most important was that "land must be valued with a view to the best purpose for which it can be used. Where a landowner is using land for pastoral purposes which is suitable by its soil and situation for agricultural purposes, it is its value for the latter purpose which must dominate the assessment. Where a landowner is neglecting his estate or devoting it to some purpose for which it not naturally suited, its taxing value must still be determined with a view to the price which would be given for it as a subject for higher utilization by a buyer who would recognize the opportunity."<sup>9</sup> From this it follows that in the supposititious sale on which the value is fixed, both buyer and seller are fully acquainted with everything that affects the value and possibilities of the land, including "situation, character, quality, proximity to conveniences or inconveniences, its surrounding features, the demand for land, and the likelihood, as then appearing to persons best capable of forming an opinion, of a rise or fall . . . in the amount which one would otherwise be willing to fix as the value of the property." Further, while endeavoring to imagine the land divested of all its improvements when searching for the unimproved value, "it is assumed that the property has its present-day environment, and is subject to all communal influences that affect value. Whatever value is due to such communal influence is taxable as part of the un-

8. In estimating the taxable value of a crown leasehold, the freehold U. V. had first to be ascertained.

9. Report, vol. ii, pp. 10, 11.

improved value." Finally, the amount of profit or loss which is actually being made at the date of valuation does not constitute the test of value, for it is a matter of personal skill, and sale price, not income, is the legal test of value for land-tax purposes.<sup>1</sup>

The principle of valuation according to highest possible utility was quite in keeping with the desire of the Federal Parliament to convert land from pasture to cultivation wherever possible. The chief criticism of it is that it ignores the fact that capital, labor, transport facilities, and profitable markets are necessary as well as suitable arable land, and these may not be immediately forthcoming, especially in a young country.<sup>2</sup> But the principle was a powerful weapon in the hands of the department, and valuers in their work considered always the best use to which land could be put. They also occasionally valued a big block on the assumption that, if the estate were divided into smaller areas, its productivity and sale value would be enhanced. Hence many disputes were taken to court on problems of use and value. Was a grazing estate fit for dairy or mixed farming? Could not a patch of ground be used best for growing lucerne? Was land near a town to be regarded as a future residential area? Was grazing land in the tick-infested area? Did tick injure the value of dairy land? Could a sheep run be cut up into wheat farms? What was the maximum carrying capacity of a run — one sheep to the acre, or four sheep to five acres? thirty-three sheep to the square mile, or fifty? On these and similar points protracted law-suits were fought, with learned judges groping through wildly conflicting estimates of carrying capacity and market value.

1. Report, vol. ii, pp. 10, 11, and vol. i, p. 14.

2. See judgment in *Duncan vs. Commissioner*, Report, vol. iv, pp. 120 ff.

Even apart from the more spectacular disputes about fundamental principles, the struggles about values were incessant.<sup>3</sup> For the land inspected by the departmental valuers up to 1920, the unimproved value returned by the holders was £250,000,000; the valuers said it was £342,000,000.<sup>4</sup> It was not uncommon for the departmental valuation, especially in the early days, to be 50 per cent greater than that of the owner,<sup>5</sup> and in one famous case a big pastoral lease was said by the lessee to have an unimproved value of £5,213, but the department valued it at £26,000.<sup>6</sup> In all cases of difference of opinion the department assessed tax on its own estimate, and left the owner either to defend his valuation in conference with the valuer in the presence of the Commissioner (or his deputy), or to challenge the Commissioner's figure before the Supreme Court of his state or the Federal High Court. During the first five years of Federal tax collection about 6,400 objections or appeals were lodged. Of these by far the greater part were settled in conference, but a few went on to the courts. While admitting that landowners did often state unimproved values far too low, the control by the Commissioner of both valuation and tax assessment was dangerous and unfair, and the need for (a) an independent valuing staff, and (b) cheaper and quicker facilities for

3. The vigor with which the department sought to get values as high as possible is illustrated in an amusing conflict with a copper-mining company. The company had issued a report to its shareholders saying that certain ore deposits had a copper content of £1,000,000. The Commissioner secured a copy of this report, and promptly based the valuation and tax thereon. Immediately the company protested that the report was "unreliable and misleading," and a critical investigation proved that it was grossly so. Report, vol. vii, p. 10.

4. Report, vol. v, p. 17; vol. vi, p. 10; vol. vii, pp. 19, 20; vol. viii, p. 30.

5. E. g., the check valuations made in 1916-19 amounted to £87,000,000, the owners' returns to only £46,000,000. Report, vol. vii, pp. 19, 20.

6. The Chief Justice of South Australia dealt with this case at length, and confirmed the lessee's valuation. Report, vol. vii, pp. 223 ff.

dealing with appeals, is generally admitted.<sup>7</sup> As a Royal Commission said in 1919, "The collection of taxes and the valuation of land are . . . incongruous functions and . . . it is undesirable that they should be reposed in one individual."<sup>8</sup>

### RESULTS

Out of all this battle of wits and wigs, what results have actually emerged from thirteen years of Federal land taxation? The Commissioner's annual reports furnish valuable statistical tables, from the analysis of which certain broad tendencies can be traced.<sup>9</sup> It is, however, necessary to remember that the period covered was one of rising prices and land values. Four years of war steepened the price curve and increased land-owners' returns, while causing, on the other hand, a scarcity of labor. In 1918-20 the price boom went even higher, and land changed hands rapidly at very high prices. Further, the check valuations of the department increased the returns of unimproved value, lifting estates from below the tax-line to above it, and increasing the taxable value of almost every estate examined. Finally, other forces than the tax were at work — such as the tendency to division of lands under settlements and wills, the purchase of land by governments for

7. See for instance report of Royal Commission of taxation of crown leaseholds, 1918 (Parl. Papers, 1917-19 session, vol. vi, pp. 1027 ff.). The Commission said that departmental valuations were "often, tho by no means invariably, high" (p. 1050), and urged that valuers should belong to a valuation office rather than be "part of the taxing machine."

8. *Ibid.*, pp. 1067 ff. The departmental valuations brought in extra taxation varying from £175,000 to over £370,000 a year. The cost of valuation up to 1918 was £100,000, which seems a small sum for dealing with 563,000,000 acres.

9. The statistics are baffling, and must be used with great care and intimate knowledge of their exact character. Most of those in the first three reports are not final. The New South Wales figures are unsatisfactory, because the state land tax is not levied on the eastern and middle districts, and the Federal officers do not therefore get that assistance from the state land-tax officers that they receive in other states.

soldier settlement, and the inducement to subdivision and sale when good prices were obtainable — and these forces alone might have caused a decline in the number or size of big estates, even had there been no heavy land tax.

The imposition of the tax undoubtedly led to a redistribution of land, especially at first and in the case of large holdings. Some, possibly much, of this redistribution was nominal rather than real, legal rather than economic. Partition of interests between joint owners, between husband and wife, between partners, and between parents and children, was "not uncommon."<sup>1</sup> The 1912-13 report refers to "a large number of transfers from parents to children. In the majority of these cases the consideration has been "natural love and affection." In others, the transferee paid a small sum of money and gave a mortgage for the balance; in some instances no deposit whatever was paid, in others the transferee agreed to pay an annuity to the parent.<sup>2</sup> The department did its utmost to combat "the considerable amount of ingenuity" displayed in these and other directions by demanding statutory declarations as to separate enjoyment of rents and profits,<sup>3</sup> and searched the Lands Titles Office documents to see if the transfer had been properly registered before sending the valuer on to the ground. Many such partitions were made during early 1910, in intelligent anticipation of a heavy land tax as the first fruit of the Labor Party's victory. In most of these divisions the estate still remained really intact, and was worked as one, in the old way.<sup>4</sup> There

1. Report, vol. i, p. 11.

2. Report, vol. iii, p. 17.

3. Report, vol. ii, p. 15.

4. In some cases this was achieved by putting the estate or estates into the hands of a proprietary (i. e., private) company, consisting solely of the former owner and the members of his family.

was no change in the use of the soil, no increased settlement of people on it.

But, in addition to these nominal transfers, there was, especially during 1910 to 1913, great activity on the part of owners in disposing by sale of surplus land, and in consequence much land passed into the hands of small or middle-sized holders, while a large portion passed entirely out of the taxable field, into the hands of men with estates worth less than £5,000 U. V.

The unimproved value of land passing out of the taxable field, by sale or transfer, from 1910 to 1921, was as follows: <sup>5</sup>

1910-11.....	£11,338,000	1916-17.....	£5,809,000
1911-12.....	11,977,000	1917-18.....	5,465,000
1912-13.....	8,610,000	1918-19.....	6,092,000
1913-14.....	7,578,000	1919-20.....	8,549,000
1914-15.....	6,714,000	1920-21.....	10,386,000
1915-16.....	5,482,000		

During those eleven years, land with a total unimproved value of £88,000,000 passed out of the taxable field. The unimproved value of all taxable land in 1910 was £184,000,000; the Commissioner estimates that the unimproved value of the land in the original tax-field was £289,000,000 in 1919.<sup>6</sup> Therefore, in terms of unimproved value, over one quarter of the land originally taxed had passed into the hands of non-taxpayers during eleven years.

We can take the inquiry further. Who sold? Who bought? What kind of land was sold? How did the absentee fare? Why did the movement of land become slower after the first two or three years, and then re-

5. Report, vol. vii, pp. 14, 15, also vol. viii, p. 31. The amount is obtained by subtracting the U. V. of land bought by taxpayers from the U. V. of land sold by them. All sales, purchases, or transfers by persons holding estates worth over £3,000 U. V. have to be reported to the department.

6. Report, vol. vii, pp. 14, 15.

cover its speed after the war? An analysis of the statistical material available, supplemented by investigation into the history of a number of estates, especially in South Australia, enables us to answer these questions with some degree of confidence.

Who sold? The unimproved value of land sold, or otherwise disposed of, by taxpayers in 1910-11 was £15,500,000; that of the land bought by them was £4,100,000. In the following year the figures rose to £17,500,000 and £5,500,000. Small men sold and bought again, but sold more than they bought. Some of the bigger men disposed of large slices of their holdings and bought little, if any, new land. For instance, during the first four years we find the following net disposals in some taxable grades: <sup>7</sup>

Taxable grade		Proportion of country land disposed of to total ownership of country land in grade
1910-11	£120,001 to 130,000	47 per cent
	110,001 to 120,000	31
	150,001 to 160,000	26
	70,001 to 80,000	12
1911-12	180,001 to 190,000	26
	350,001 to 400,000	24
	140,001 to 150,000	18
	250,001 to 300,000	18
1912-13	160,001 to 170,000	36
	100,001 to 110,000	29
	80,001 to 90,000	19
1913-14	170,001 to 180,000	23

Resident holders with taxable balances of over £200,000 got rid of land worth £7,500,000 U. V. between 1910 and 1920, and bought only £1,700,000 U. V. of land.<sup>8</sup> When crown leaseholds were taxed, some big lessees sought escape by disposing of leased lands of high unimproved value and then bought leases of lower

7. Report, vol. iv, pp. 18, 19.

8. Compiled from schedules of sales and purchases, Report, vols. i to viii.

value. One company reduced its land-tax payment from £79,000 in 1915 to £56,000 in 1917, by getting rid of 600,000 acres of freehold and conditional-purchase land, and by securing crown leases worth £217,000 U. V. in 1917, in place of the leases worth £750,000 in 1915.<sup>9</sup> But while the big men disposed of much land, the smaller taxpayers also reduced the value of their holdings. The following table shows the unimproved value of land sold and bought by resident taxpayers during the first eight years:<sup>1</sup>

Taxable grade	U.V. of land sold	U.V. of land bought	Ratio of sales to purchases
£1 to 10,000	£31,000,000	£14,000,000	2.2 :1
10,001 to 50,000	30,000,000	11,000,000	2.7 :1
50,001 to 200,000	21,000,000	4,000,000	5.25:1
Over 200,000	7,000,000	1,000,000	7 :1

Thus, the higher the grade, the greater the difference between sale and purchase.

One aim of the land tax was to hit and drive out the absentee landowner. If we disregard the fact that some of the leading absentees held as shareholders in companies, which were not regarded as absentees, the tax achieved some of its purpose. The absentee owner had long been a target for popular indignation. He was supposed to be owning vast areas, to be leaving his land idle, drawing large incomes from Australia and contributing nothing toward the revenue or defense of the country.<sup>2</sup> Therefore he was penalized by enjoying no

9. Report, vol. vii, pp. 32, 34, 36. This company in 1915 held 1,400,000 acres of freehold or conditional purchase, and 3,400,000 acres on crown lease. It disposed of nearly half the former, doubled its area of the latter, and then apparently got rid of the original valuable crown leaseholds.

1. Compiled from Report, vols. i to vii, schedules of sales and purchases.

2. E. g., Mr. Mackay, first Federal Commissioner of Land Tax, told the Dominions Royal Commission that "the absentee landlord also is, as a rule, not the class of owner who uses the land to the best advantage." Report, vol. ii, p. 59.

exemption and by having to pay a penny in the pound more than the resident taxpayer. The work of the tax-collector soon produced evidence which showed that, apart from companies containing absentee shareholders, the menace of the overseas landowner had been exaggerated. In 1910 there were only 3,606 absentee owners, against nearly 11,000 residents liable for the tax and about 700,000 owners below the tax line.<sup>3</sup> The absentees' land was worth only £6,700,000 U. V. in 1911. It was chiefly freehold, and much of it in town blocks. It was not lying idle or in a state of nature, for its improved value was 66 per cent above its unimproved value, at a time when the improved value of resident taxpayers' lands was 91 per cent above their unimproved value. Only 127 absentees owned lands worth more than £20,000 U. V., and of them only 16 were above the £80,000 mark.

How the tax affected the absentee, the following record, covering the period 1910-20, will show:<sup>4</sup>

Area of country land owned by absentees fell from 1,372,000 acres to 911,000.

U. V. of this land fell from £2,660,000 to £1,234,000.

U. V. of town and country land sold was £3,130,000.

U. V. of country and town land bought was £370,000.

U. V. of all absentees' land in 1911 was £6,708,000.

U. V. of all absentees' land in 1919 was £4,058,000.

In all the ten years, only 46 purchases of land were made by absentees paying tax on more than £7,000; and even in spite of the increase in land values, the number of absentees paying on more than £20,000 dropped from 127 in 1911 to 75 in 1921.<sup>5</sup> There were still, in 1921, 3,128 absentees; but altho the number had fallen only about 500 in nine years, the value of their holdings had

3. Knibbs, *Private Wealth of Australia*, p. 41.

4. Compiled from schedules of absentees' sales and purchases, Report, vols. i to viii.

5. Report, vol. viii, p. 53.

been much reduced. The taxation of crown leaseholds caused absentees to reduce their holdings of this kind from 10,000,000 acres to 3,900,000 between 1915 and 1919.<sup>6</sup>

From various sources we learn details of the energy with which big holders got rid of part of their holdings during the years 1910-12. Even before the land-tax bill was submitted to Parliament, many landowners, anticipating the imposition of new taxes by the Federal, Victorian, and Tasmanian legislatures, sold largely. The Federal act offered concessions to holders who sold between June and September, 1910, and in the rush to take advantage of this clause,<sup>7</sup> land worth £2,700,000 U. V. was sold by taxpayers in three months.<sup>8</sup> In some notable cases tenants on large estates were allowed to purchase their holdings on easy terms, and a wave of subdivisinal sales swept over the big holdings, especially those within the arable or mixed-farming areas. For instance, in South Australia there were four freehold pastoral estates, close together, with a total area of over 110,000 acres, almost all suitable for agriculture. On one of these estates four subdivisinal auction sales were held at intervals of seven to eleven months; on the second, two sales took place, with an interval of two years between; much of the third estate was sold to the government for closer settlement; and the fourth owner sold 6,600 acres by auction in 1912, offering to allow four fifths of the purchase price to remain on mortgage

6. Report, vol. viii, schedule 10. Country people living near absentee estates tell how some big holders come to reside in Australia for a long enough season periodically to allow them to claim residents' rate of tax. Some of the fall in absentee holdings is very probably fictitious. Some absentees turned themselves into companies, and thus their lands were legally held by a resident body. Others arranged for some resident to become legal owner.

7. Land Tax Assessment Act, 1910, section 12.

8. Report, vol. i, p. 24.

for seven years at  $4\frac{1}{2}$  per cent. By such offers of easy terms it was not difficult to dispose of land at good prices, and many big holdings were reduced in size — but not at prices which meant a sacrifice by the seller.<sup>9</sup>

Who bought? The big men drastically reduced the value of their holdings, and generally the area as well. The Commissioner declares on various occasions<sup>1</sup> that taxpayers having unimproved values of £5,000 to £50,000 have made extensive purchases, notwithstanding the tax; this may be true in many individual cases, but for the group as a whole the ratio of purchases to sales given in a previous paragraph suggests that, even in the lowest grades, there was more selling than buying, and that the trend of owners was towards lower taxable values, even if not toward smaller holdings. As already seen, land worth £88,000,000 U. V. passed out of the taxable field in ten years, as a result of sales or transfers. During that period owners of property worth between £3,000 and £5,000 U. V. reported that they had sold £27,000,000 U. V. of land and bought £42,000,000. So £15,000,000 out of the £88,000,000 had gone to the men just below the tax line. The remainder, £73,000,000 U. V., had therefore passed to holders below the £3,000 line.<sup>2</sup>

9. See evidence and judgment in case of *Duncan vs. The Commissioner*, Report, vol. iv, pp. 120 ff. In one case concerning which information has been obtained, the owner sold an estate during the boom period of 1919 at a high price, and invested the money in tax-free government loan stock. Brady (*Australia Unlimited*, 1918, p. 844) says, presumably on the authority of the vendors, that the trustees of one of the largest and oldest estates in South Australia "have disposed of many of the . . . properties owing to the recent government taxation." These properties had comprised over 100,000 acres of freehold, and thousands of square miles of leasehold. By 1918 almost the whole of the freehold had been sold. In another big old estate the land was cut up and let on share-farming (i. e., *métayage*) conditions. In 1914 the share farmers were offered the chance to buy their holdings on easy terms, and most of them accepted the offer.

1. E. g., Report, vol. v, p. 19.

2. Compiled from schedules of sales and purchases, Report, vols. i to vii.

The buyers were sometimes men new to land-owning, and their purchases thus increased the number of holdings in the country; but in some cases the purchaser was a neighboring farmer, who bought in order to increase the size of his farm.<sup>3</sup> Unfortunately we have no "final" figures showing the number of taxpayers in each taxable grade during 1910-13.<sup>4</sup> We can gather, however, from the provisional statistics that the increase in the number of taxpayers from 14,920 in 1910 to 17,469 in 1913 was almost entirely due to the growth in the number of persons paying tax on £10,000 or less. The number of big owners declined. The entry of small men into the taxable field was due to (a) purchase of enough land to bring non-taxpayers above the £5,000 mark; (b) departmental valuations, which often had the same effect; (c) natural increases in unimproved value. From 1913 onward we have final figures showing the distribution of taxpayers by taxable grades, and these can be analyzed as follows:<sup>5</sup>

Taxable balance	1913-14	Number of taxpayers		
		1914-15	1915-16	1919-20
£1 to 10,000.....	13,710	14,203	14,508	14,814
10,001 to 50,000.....	3,198	3,386	3,460	3,629
50,001 to 100,000.....	407	473	450	428
100,001 to 200,000.....	112	118	113	88
200,001 to 500,000.....	36	43	45	34
Over 500,000.....	6	6	8	6
Total .....	17,469	18,229	18,584	18,999

The increase in all grades in 1914-15 is explained largely by the inclusion of crown leaseholds. In the same year the rate of tax was increased, and these two

3. E. g., in the sale of 6,600 acres (see note 9 on p. 440, supra), all the buyers except one were neighboring farmers. Report, vol. iv, p. 122.

4. In each annual report a table is given showing the number of taxpayers in each grade; but the figures are not final till 1913-14.

5. Compiled from schedules showing grades of taxable balance, Report, vols. iv to viii.

factors doubtless account for the decline in the number of holdings over the £50,000 mark from 640 to 556 between 1914-15 and 1919-20. The number of taxable small estates almost stood still, while the total unimproved value of all taxable land fell slightly,<sup>6</sup> thus supporting the evidence as to the movement of land into lower grades, or out of the taxable field entirely.

A cruder test of land redistribution is furnished by the state records of holdings alienated or in process of alienation, classified according to size. Between 1910 and 1920 the area of land alienated or in process of alienation in Australia (Queensland excepted) increased by 22,000,000 acres. The area in holdings of over 50 acres increased by just over 21,000,000 acres. Comparing the detailed returns for 1910-11 and 1920-21, we get the following results:<sup>7</sup>

The smaller holdings grew slowly in number, the

Size of holding acres	Number of holdings		Increase or decrease per cent	Area of land in grade (in thousand acres)		Increase or decrease per cent
				1910-11	1920-21	
51 to 100	20,384	20,892	+ 2.5	1,566	1,546	- 1
101 to 500	62,437	66,915	+ 8	15,856	17,017	+ 7
501 to 1,000	22,952	30,183	+31	16,347	21,490	+31
1,001 to 5,000	17,049	24,772	+45	32,126	46,752	+46
5,001 to 10,000	1,395	1,902	+44	9,573	13,071	+37
10,001 to 20,000	659	793	+20	9,086	10,794	+19
20,001 to 50,000	382	337	-12	11,335	9,658	-15
Over 50,000	111	82	-26	10,175	7,057	-30

6. Report, vol. vii, pp. 14, 15. In 1913 the U. V. of taxable land was £203,500,000. In 1917 it was (excluding crown leaseholds) £199,250,000.

7. Compiled from Commonwealth Year-Book. This table has certain defects. The omission of Queensland, for which state no classified returns are available, prevents us from seeing the effect of the heavy state and federal taxes. The non-inclusion of holdings below 50 acres excludes the orchards and similar small blocks, the number of which grew considerably during the period. Further, the decade dealt with witnessed the abandonment of alienation in freehold by New South Wales and Queensland; even small holdings were granted only on leasehold, and so do not appear in the above figures. Hence the number of small working units grew much more than the figures suggest.

medium and large estates increased considerably, with the greatest growth in the 1,000- to 5,000-acre type of extensively cultivated mixed-farm or grazing holding. Beyond the 20,000-acre mark there was a big decline both in the number of estates and in the area held. In New South Wales, the chief home of very large holdings, the number of estates of over 50,000 acres dropped rapidly from 99 in 1910 to 84 in 1912, and then fell steadily to 71 in 1920. There were 267 estates of between 20,000 and 50,000 acres in New South Wales in 1911, and the number had grown from 202 in 1901. By 1914 there were only 235, and in 1920 only 229. In Victoria the last holding of over 50,000 acres disappeared soon after 1912, and the number of estates between 10,000 and 50,000 acres fell from 173 in 1910 to 152 in 1919. In South Australia there was a similar fall from 76 to 54.

This decline in the number of large holdings took place chiefly during two periods. The first was just before or immediately after the passage of the Federal Act, and can be regarded as the direct result of the imposition of the tax. But most of the big plans for tax evasion by subdivision, transfer, or sale had been carried through by 1912 or 1913, and hence there was a lull for a few years. The second phase came when the state authorities began to buy land in large quantities for the purpose of settling returned soldiers. Up to the middle of 1922 nearly 5,000,000 acres of private land had been acquired for soldier settlements, and a large part of this area had formerly been held in large estates. Further, the boom which followed the Armistice, with wheat selling for a brief season at 9 shillings a bushel, caused a vigorous outburst of land transfer, during which many large holdings were cut up and sold at very high prices. Hence, between the middle of 1918 and

the middle of 1921, land worth over £25,000,000 U. V. passed out of the tax field, and the area of this land was probably at least equal to that of the land transferred to non-taxpayers during 1910-12. No statistics are available yet to indicate the effect of the depression since 1920 on land-ownership; but we know that the price of wool has remained high, while that of wheat and dairy products has fallen heavily. Hence many farmers who bought land in the high-price period are in difficulties, and there has probably been little passage of land from large to small holdings.

When the bill was passing through the Federal Parliament, opponents of the measure prophesied that much marginal land would have to be surrendered to mortgage-holders or abandoned for lack of buyers. The arrival of this unsalable land in the market would lower the value of all holdings, large and small, and the ruin of many marginal producers was inevitable.<sup>8</sup> The supporters of the tax hoped that land would be made cheaper. Let us see if these predictions were correct. It is true that some landowners, whose holdings were heavily mortgaged, and whose income left little or no margin when interest charges had been met, were unable to pay the tax and got rid of their holdings.<sup>9</sup> But the land was not sold at "bargain prices," nor did the heavy sales of the first three years glut the market. In South Australia big landowners spread the disposal of their land over two or more subdivisional sales;<sup>1</sup> they cut the areas up into small blocks, offered easy terms, and were thus able to secure good prices.<sup>2</sup> The seasons of 1910-

8. Turner, *First Decade of the Australian Commonwealth*, pp. 290, 291.

9. Commissioner Mackay's evidence before Dominions Royal Commission, Report, vol. ii, p. 61.

1. On one estate four auction sales were held at intervals of 7 to 11 months.

2. E. g., one sale of 6,600 acres, part of a sheep station, but suitable for agriculture, brought an average gross price of £7-7s an acre.

13 were good, land products sold at high prices, and so buyers were usually willing to pay well for land. As the Commissioner remarks in his 1913-14 report: "It might have been expected that prices of land would have lessened appreciably; but so far as the record of actual transactions is concerned no such tendency has yet clearly manifested itself. Owners, notwithstanding adverse conditions, continue to hold out for prices which do not represent a sacrifice."<sup>3</sup> The drought of 1914-15, coming on top of the extra taxation and the extension to crown leases, imposed a strain which might have seriously depressed land values. It did not do so to any great extent. Purchases of land for agriculture and grazing were less plentiful, and in some districts agricultural land suffered some depreciation. But, as a rule, landowners generally "showed no disposition to sell, as with a return of good seasons . . . the prospects of recouping losses and securing substantial profits in future, owing to the altered conditions due to the war, have maintained confidence."<sup>4</sup> Further, the act was amended in 1914 to allow partial or complete relief from tax to those who could prove "that by reason of drought or adverse seasons, or other adverse conditions the returns from the land have been seriously impaired." This provision, along with others dealing with cases of extreme hardship, relieved many from the fear of compulsory disposal of their land in the droughts of 1914-15 and 1919-20.

In selling land in order to reduce the weight of the tax, it seems to have been a general practice to get rid of land with a high unimproved value, and sometimes to replace it with land of lower value. If a pastoralist was using agricultural or dairy land for pastoral purposes, he would sell this and possibly buy some inferior land to

3. Report, vol. iv, p. 17.

4. Report, vol. v, p. 18.

take its place. This tendency seems to be borne out by the following table,<sup>5</sup> which shows that the land sold by owners in a grade often had an average unimproved value greater than that of the whole land in the grade, while the unimproved value of the land bought was lower than the grade average.

Taxable grade	Average U.V. of all country land in grade		Average U.V. of country land sold in grade		Average U.V. of country land bought	
	£	s d	£	s d	£	s d
1 to 1,000			2 30 p. ac.	2 90	2 70	
1,001 to 2,000			1 18 0	2 90	1 16 0	
120,001 to 130,000			3 18 0	6 90	None bought	
140,001 to 150,000			3 19 6	7 2 6	None bought	
450,001 to 500,000			1 70	2 80	1 16 0	
Over 500,000			2 30	3 2 6	1 9 9	
All taxable country land			1 19 0	2 30	1 16 0	

These few instances taken from the returns for 1910-11 show that owners endeavored to reduce their taxable balance by selling land which was too good for their purpose, and thus helped to transfer large areas of suitable land to the agriculturist, grazier, dairy or mixed farmer.

#### THE FUTURE OF AUSTRALIAN LAND SETTLEMENT

It is now evident that the Federal Land Tax has only partially succeeded in achieving its purpose. Its effect in the years ahead will be decided partly by the vagaries of the net profit on wool, and also by the extent to which farmers and governments are able and willing to offer attractive prices for land. But it is probably true that there are now very few really large estates which are capable of subdivision for wheat or mixed farming. Mere bigness is not in itself a crime, — except

5. Schedule of sales and purchases 1910-11, Report, vol. iv, pp. 31-35. Brady (Australia Unlimited) shows that this was a general practice. One South Australian estate of 43,000 acres, with a 17-inch rainfall was reduced to 20,000 acres. The owner then bought 96,000 acres further north with a 7-inch rainfall, and 6,000 acres with a 9-inch rainfall.

in the eyes of election orators, — and over large parts of out-back Australia the sheep industry can be carried on and maintain the quality of its product only by the use of large areas, with large expenditure for fencing, water conservation, and the purchase of high-quality stud stock. The big pastoralist may be an obnoxious person in the eyes of small cultivators and city dwellers. He may be vulgarly rich, reactionary in his political views, and selfish in his outlook on the rest of the community. But his industry has been the backbone of Australian economic life for a century, and the mainstay of its export trade. Any further attack on him is justified only if Australians are very sure that the land he holds can immediately be put to much better use.

Meanwhile, the further development of close settlement is faced with difficulties. There is a land hunger which cannot be met. In August, 1923, the government of New South Wales offered five blocks of crown land in the southern part of the state. For these five blocks there were 1,112 applicants. Two months later there were 625 applicants for another nine holdings. At the same time there is a steady drift of population to the cities. In no state is the rural area retaining its own natural increase. In spite of the spending of vast sums on railways, roads, land-resumption, assisted immigration, and advances to settlers, there were only 90,000 more people engaged in agriculture in 1921 than in 1891. The capital cities house 43 per cent of the whole population. Decaying rural towns are dotted all over the map of eastern Australia.

During the past seven years three parliamentary committees have asked why these things should be. The answers are many. The decline of mining centers is one cause. The protectionist policy has favored the growth of the big cities. Railway lines run like a fan from the

state metropolis, and railway rates seem to favor the manufacturer and merchant in the capital at the expense of his provincial rival. High wages, the social attractions, and educational or medical facilities of the big cities make the dullness and lack of social amenities of the countryside stand out in black relief.

But most important of all is the lack of any further supply of good crown land. Statistically it is true that Australia has an area of over 3,000,000 square miles. But in terms of quality, considering especially rainfall from the point of view of quantity, certainty, and season, only about one quarter of the continent is fitted for close settlement by the white race.<sup>6</sup> One third is a trade-wind desert, useless as the Sahara; the tropical north is an unsolved problem. The quarter that is fit for close settlement comprises the eastern and southeastern strip of the continent, along with the southwest corner, and parts of Tasmania. But virtually all the land in those areas has already been taken up; on it one finds about 5,250,000 people out of the total 5,600,000. The good crown land has been alienated almost entirely, and when governments needed land for the settlement of returned soldiers they were compelled to buy most of it back from private owners. Hence, any further growth of rural settlement means either a more intensive and better use of land already occupied, or the expenditure of vast sums on railways, public works, and water supplies for the semi-arid fringe beyond the settled area.

Whatever the track followed, the cost will be great. The small settler usually has little capital, and has

6. See Taylor, G., *The Physiographic Control of Settlement*, in *Australia: Economic and Political Studies*, edited by Atkinson (Macmillan, 1920). Professor Taylor, who is professor of geography in Sydney University, wrote in 1923: "It is time we made a frank avowal of the useless character of much of our continent." (*New Outlook* (Sydney) April 19, 1923.)

therefore to be assisted by being allowed to pay for his land through a long series of amortization payments, in addition to receiving advances for improvements, purchase of implements, stock, etc. How great the cost may be is seen from an unhappy experience recently in New South Wales. A plan was prepared for the settlement of 6,000 farms. But it was discovered that the cost of buying private land, of preparing some crown land, of constructing public works, and of making advances for improvements and equipment, would amount in all to nearly £20,000,000. Obviously, therefore, any ambitious schemes of new settlement would involve the Australian governments in colossal borrowing operations; and since there are loans amounting to £400,000,000 to be met between 1924 and 1930, any big addition to the load of debt would be unsafe and unwise.

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## THE EARLY DEVELOPMENT OF THE AMERICAN COTTON MANUFACTURE

### SUMMARY

Chronological table by states of the foundation of cotton factories. Comparison with contemporary statistics, 453.—Accuracy of the dates, 456.—Omission of defunct factories from the table, 458.—Chronological table by states of textile companies incorporated, 460.—Inferences from the tables. Importance of the period of the war of 1812, 463.—Relation of factory establishments to tariff legislation, 468.

OF American industries, the cotton manufacture was the first to present the features of the modern factory system. Some other industries, it is true, even in the colonial period, might be described as devoted to the "centralized production of wares," but they were prosecuted on too small a scale, and remained too near the grade of the village workshop, to show the characteristic features of the development following the industrial revolution. Such "factories" as appeared were sporadic and ephemeral. The cotton manufacture, on the other hand, from the time of Slater's establishment at Pawtucket, 1790, maintained a higher level of organization, and developed so rapidly both in the size and in the structure of its representative units that its position as leader in the new methods of production was long unquestioned. The early history of the American cotton manufacture, therefore, deserves illumination from every angle, and a contribution to it which is somewhat general and speculative in character may be justified.

A resolution of the House of Representatives, introduced by Mr. Adams of the committee on manufactures,

and adopted January 19, 1832,<sup>1</sup> directed the secretary of the treasury to obtain information regarding American manufactures with a view to an adjustment of the tariff. The secretary appointed commissioners to collect the information, who made their returns to him in the course of three or four months; and the returns were printed in two stout volumes in 1833.<sup>2</sup> Viewed as a census of production the report was a distinct failure. Returns from some states were scanty or were lacking altogether. Judged, however, not by what it omitted but by what it included, the report is one of the most valuable sources in American industrial history. It presents many original returns from individual manufacturers, and still more of local accounts, only one degree removed from the original. Raw material it is, to be sure, and at first sight forbidding, but just because it is raw it is eternally fresh; in few government documents do we get so close to the economic life of the time.

One of the queries propounded by the commissioners who collected the information for the McLane Report related to the date when each manufacturing enterprise was established. The query had little sense when applied to the industries of the household or small shop, and did not extract much definite information when applied to the woolen industry, which had passed by imperceptible grades from the household to the factory stage. The query had a real significance in the cotton industry, in which the introduction of improved spinning machinery marked pretty sharply the adoption of

1. *Debates in Congress*, vol. viii, part 2, p. 1586.

2. First session, 22d Congress, 1831-32, House Document No. 308, vol. vii, parts 1 and 2; official document check list numbers 222, 223. The document is usually cited as the McLane Report, since Louis McLane was then secretary of the treasury. Lippincott, *History of Manufactures in the Ohio Valley*, cites it as the Neville Report, since Morgan Neville made the returns from the state of Ohio.

the factory system. Almost all the states which were of importance in cotton manufacturing were included in the scope of the McLane Report. The material in that report appears, therefore, to promise the most compre-

## COTTON FACTORIES BY DATE OF ESTABLISHMENT

	Maine	N.H.	Vt.	Mass.	R.I.	Conn.	N.Y.	N.J.	Total
To 1805	..	..	..	1	1	2	1	..	5
1805	..	..	..	1	1	..	..	..	2
1806	..	..	..	1	1	1	3	..	6
1807	..	..	..	..	4	..	..	..	4
1808	..	..	..	1	..	..	2	..	3
1809	1	..	..	1	..	1	3	..	6
1810	..	1	..	3	2	2	2	..	10
1811	..	..	..	5	1	1	1	1	9
1812	..	..	1	9	4	3	9	1	27
1813	1	..	..	13	3	3	2	1	23
1814	..	3	..	12	4	6	15	3	43
1815	..	2	..	4	2	3	3	1	15
1816	..	2	..	1	..	..	2	1	6
1817	..	3	..	..	1	..	1	..	5
1818	..	1	..	1	1	1	1	..	5
1819	..	..	1	..	2	..	1	..	4
1820	..	1	..	4	..	2	..	..	7
1821	..	1	..	2	..	1	..	..	4
1822	..	1	..	3	1	2	2	2	11
1823	1	2	..	4	5	7	2	1	22
1824	..	4	1	2	4	5	1	..	17
1825	..	1	..	8	2	6	4	3	24
1826	..	1	..	7	6	2	7	1	24
1827	..	1	1	4	5	4	5	2	22
1828	..	7	1	7	3	13	10	7	48
1829	..	3	..	6	2	5	1	..	17
1830	..	2	..	3	7	4	6	2	24
1831	..	4	3	10	8	6	14	11	56
1832 *	2	..	..	4	..	7	..	6	19
Total dated	5	40	8	117	70	87	98	43	468
Undated	1	2	2	75	49	14	14	0	157
Total enumerated	6	42	10	192	119	101	112	43	625

\* The figures refer only to the first part of the year. Most of the returns from manufacturers and local enumerators were dated March or April, 1832, but I have included in the figures mills under construction, not yet in operation.

hensive information, readily available, on the rise of the factory system in this country, and from it I have compiled the preceeding table.

The figures of this table appear to offer a statistical basis of considerable stability, on which to found hypotheses regarding the early development of the cotton industry in this country. Such value as they possess depends, however, upon full recognition of their peculiar character and imperfections, and in succeeding paragraphs I shall discuss certain points that ought to be borne in mind when the figures are put to use.

The least of their faults is one rather obvious criticism, that the total of factories enumerated cannot be taken as a complete list of those which were actually in operation, even in the states listed, at the time when the figures were compiled. The best source by which to check the total is the report of the committee on cotton manufactures of the Friends of American Industry, appointed at the convention held in New York in October, 1831, which presents figures compiled between that time and February 11, 1832, the date of the report.<sup>3</sup> For convenience of comparison, the figures of the McLane Report are repeated here, with the figures of this committee representing the manufacturing interests.

The close correspondence of the two sets of figures in most states is obvious. In New York the figures are

3. The report is published in *Journals of the Proceedings of the Friends of Domestic Industry*, by Hezekiah Niles, Secretary, Baltimore, 1831, pp. 105-112. The facts, gathered by a private association of manufacturers to demonstrate the importance of their industry, may have been incomplete for lack of an effective organization of enumerators, but were certainly designed to include everything available. The complaint of Niles, in his *Register*, February 18, 1832, vol. xli, p. 441, that the figures for the cotton industry were short of the actual amount by one fourth or one third seems to me to deserve little weight in the present discussion. It was based in large part on the failure of the committee to cover parts of the field which lie outside the states represented in my table; and Niles was an insatiable protectionist.

## COTTON FACTORIES ENUMERATED, 1832

	Me.	N.H.	Vt.	Mass.	R.I.	Conn.	N.Y.	N.J.	Total	U.S.
McLane Report . . . .	6	42	10	192	119	101	112	43	625	..
N. Y. Report . . . . .	8	40	17	250	116	94	112	51	688	795

identical, and I am tempted to call attention to the fact that the McLane Report for New York was said to have been "prepared with great care — the fruit of many months of labor and perseverance," and was believed to present "an entire view of all the cotton establishments in the State."<sup>4</sup> So likewise in Maine, the slight discrepancy might be explained on the ground that the manufacturers' committee may have included two factories, "neither of which are in operation, and apparently in a state of decay,"<sup>5</sup> which I omitted from enumeration. On the whole, however, I am surprised to find the figures agree so closely in these and in some other states. The definition of a "cotton factory" is so vague that one would expect to find a great variation in the number of factories counted by different people in the same district. So in the state of New Jersey there is a considerable discrepancy between the figures of the New York Report, and those which I have compiled from the McLane Report, and yet that is a state in which the official who contributed the statistics for the McLane Report frankly confessed that he had "called on the committee appointed to collect information for the Tariff [i. e., New York] Convention, and . . . filled up the tabular statement from their calculations, to give as full and satisfactory a statement as it is possible to procure."<sup>6</sup> There is in the comparison above only

4. McLane Report, vol. ii, p. 59; cf. *ibid.*, p. 1.

5. McLane Report, vol. i, p. 19.

6. McLane Report, vol. ii, p. 134. In compiling the figures for my table I have included mills producing either yarn or cloth, or both, but have omitted mills with such specialized product as batting, candle wick, warp, or sewing thread; I have excluded mills producing lace or hosiery,

one state, Massachusetts, in which the manufacturers who reported to the New York Convention enumerated a total number of cotton mills greatly in excess of the number listed in the McLane Report. We have a rough means of testing the figures in this state by comparison with the Statistical Tables exhibiting the condition and products of certain branches of industry in Massachusetts, for the year ending April 1, 1837, prepared from the returns of the assessors by the secretary of the state, and published at Boston in 1838. Returns were made for every town in the state, some three hundred in number; and these returns gave minute details regarding the industrial resources of the state. This industrial census, taken five years after the other two, gives a total of 282 cotton mills in the state, to be compared with 250 in the New York Report and 192 in the McLane Report. Comparison by counties, and in the counties where the discrepancies are most striking, Worcester and Hampden, by towns, leads to the conclusion that the McLane Report did not omit any territorial area, but in various towns, all over the state, failed to include mills which appear in the Massachusetts Statistical Tables. Some of these mills may have grown up in the interval, altho this was not a period of active development in the cotton manufacture.<sup>7</sup> Some mills may have escaped enumeration in 1832 because they were so insignificant, such as the mill at Russell, which in 1837 had 150 spindles, had an invested capital of \$500 and a

and bleaching and printing works. Mills with a mixed product, cottons and woolens for example, are counted only in the cases in which more than half of the value of the product was cotton goods. Mills are classed according to their product at the time of establishment; so the Hamilton Manufacturing Company of Southbridge, Massachusetts, making woolens in 1832, appears in the table under the date of 1815, when it was established to manufacture cottons.

7. Cf. Victor S. Clark, *History of Manufactures*, Washington, 1916, pp. 383, 545.

manufactured product of \$600, or the three mills at Lancaster which altogether gave employment to four males and four females.<sup>8</sup> But in Springfield, for example, the McLane Report listed only one cotton factory, a large corporation, with a capital of half a million and an output of three million yards a year, and it is hard to reconcile this account with the enumeration in 1837 of seven mills, with invested capital of nearly a million and a half and with an output of over eleven million yards, except on the supposition that the enumeration of 1832 was faulty.<sup>9</sup> On the whole we must concede, I think, considerable imperfection in the McLane Report on the cotton manufacture in Massachusetts; but so far as I can see this affects only the quantity of evidence at our disposal, and does not impair its quality.

A second line of criticism attacks not the completeness but the accuracy of the figures. Exactly what did a date signify, as given in the returns from which the table is compiled, and was it an accurate statement of fact? The usual question put to factory owners in the states covered by the table, was "When established?" in Massachusetts it took the form, "When begun?" The difference in the form of question is of little consequence, for a comparison of answers makes clear that different answers could be and were in fact given to the same question. A factory might be dated from its incorporation, from the beginning of building operations, or from the beginning of manufacturing. When the specific information was available, I have chosen the date at which actual manufacture began; when there was a choice of dates without indication of their exact significance, I have chosen the earlier.

8. Statistical Tables, Mass., 1837, pp. 89, 53; these are among the mills which are not enumerated in the McLane Report.

9. Cf. Statistical Tables, p. 90, and McLane Report, vol. i, p. 284.

The uncertainty in the significance of the dates is regrettable. At best it blurs the figures. If we attempted to plot in graphic form the figures of the table, we should have to reduce the sharpness of the angles, and smooth the outlines of the graph. If we seek to study the influence on the cotton industry of specific events, such as tariff acts, we must recognize that our dates of establishment have not quite the precision that the bare figures seem to indicate. Still, I have found nothing to forbid the assumption that a manufacturer, in choosing one of several possible dates to mark the beginning of his establishment, was restricted nevertheless to a pretty narrow interval, say two or three years, and that tho the figures of a single year are rather shaky, taken by themselves, they are much firmer when taken in connection with the figures for the years immediately preceding and following. The dates not only vary in significance; some of them are doubtless incorrect. Let us admit that they are crude material, and make the best of it; to refine them by local investigations would be an undertaking so arduous that it may well be postponed.<sup>1</sup>

There is one, but as far as I can see only one, considerable element of bias in the figures of the table. Most of the factories enumerated had changed hands in the course of their history, had been "reorganized" to use

1. Descriptions of the same factory appear sometimes in different parts of the McLane Report, and I have attempted to gather the dates from the report wherever I found them. Occasional conflicts I have solved by following what appeared to be the better authority, or, in case of doubt, by choosing the earlier date. I have not attempted to check the dates in the report by reference to other sources, or to introduce dates from other sources when they were not given in the report. Experiment proved the difficulty of identifying a given mill to be so great that it appeared to be unwise to mix the material. When a mill was returned as established "five years ago" I have dated it 1827, in a few instances when a mill was returned as established "about" a given date I have marked that date, but in the many cases in which mills were returned as established "very early," "recently," "a few years ago," etc., I have marked them as undated.

the modern term. As the table is designed to picture actual physical development, not mere changes in ownership, I have consistently refused to recognize dates of reorganization. In every case in which a factory is listed as established at a certain date, but with the statement or implication that it had previously been operated by other owners, I have marked it as undated. There are enough of these cases to give ground for the belief that some dates which I have accepted as dates of original establishment, for lack of indication to the contrary, are actually dates of reorganization. The result of this would be to raise the level of the figures in more recent years, to depress the level of the earlier years. It is on this account that I have given preference always to the earliest date, when there was a choice without indication of the exact significance of different figures.

Still a third line of criticism must be indicated before it will be profitable to attempt to base any inferences on the statistics of the table. The figures give us an imperfect picture of the development of the cotton industry, not merely because some mills, about one fourth of the total, were undated in the McLane Report, but also because no mills are included which were not in actual operation or being prepared to begin operation at the time of that report. The dates apply merely to a select class of mills, namely those which in one form or another, and after whatever vicissitudes, managed to survive until the year 1832. The rate of mortality of early ventures in cotton manufacture was very high. We do not ordinarily, I think, give due weight to this factor in our industrial development; the success of some enterprises has distracted our attention from the failure of many others. But for present purposes it is important to note that the failure of an individual business did not necessarily involve the disappearance of the factory.

Mill site, building, and machinery remained, and the old shell often housed a new incumbent. Even when factories were damaged by flood or fire, the records show that they were repaired with surprising, indeed unreasonable, persistence. Occasional reference in the McLane Report to abandoned factories, such as the two in Maine referred to above, do not alter the conclusion that in this later period factories, when once established, usually continued more or less regularly in operation.

Evidence to confirm my argument that the figures of the table, in spite of many imperfections, may still serve as an index of activity in the development of the early American cotton industry, is furnished from another source. The secretary of state was directed by a Senate Resolution of March 1, 1823, to ascertain "A list of the factories in each State employed in manufacturing for sale such articles as would be liable to duties if imported from foreign countries; . . . the capital of each factory, and whether it is incorporated or not by State laws."<sup>2</sup> For present purposes only the answer to the last question is of importance. The governor or secretary of state of each state furnished a list of the companies incorporated in his state, with the dates and objects of incorporation, and from these lists I have compiled the following table. The table includes, it will be noted, both cotton and woolen. The two articles are commonly named together in the act of incorporation, often with other articles, of which some seem most incongruous: nails, paper, scythes, axes, linseed oil, etc. One company was incorporated to manufacture cotton, wool, flax, leather, iron and wooden articles; another to manufacture cotton, wool, flax, hemp, earthenware, and iron. The act of incorporation gives no indication, of course,

2. American State Papers, Finance, vol. iv, pp. 397-459, No. 691.

of the major activity of the company when it began operations, or indeed whether it ever did carry out the plans of its promoters.<sup>3</sup>

## COTTON AND WOOLEN MANUFACTURING COMPANIES

## BY DATE OF INCORPORATION

	N.H.	Vt.	Mass.	Conn.	N.Y.	N.J.	Total
To 1807 .....	1	..	..	..	..	..	1
1807 .....	..	2	1	..	..	..	3
1808 .....	2	1	1	..	..	..	4
1809 .....	3	3	6	..	4	1	17
1810 .....	5	4	2	..	6	..	17
1811 .....	4	2	7	..	16	..	29
1812 .....	6	4	10	2	13	..	35
1813 .....	4	2	16	1	29	1	53
1814 .....	10	4	35	13	37	2	101
1815 .....	2	2	23	10	15	3	55
1816 .....	1	..	8	..	6	1	16
1817 .....	1	..	..	2	2	..	5
1818 .....	..	..	2	3	4	..	9
1819 .....	..	..	1	4	1	..	6
1820 .....	1	..	2	..	1	..	4
Total .....	40	24	114	35	134	8	355

It is an easy matter to compile the dates of incorporation from the material gathered by the secretary of

3. The lists appear to have been, in general, a complete record of incorporations, without regard to their later history. So in New Hampshire the secretary of state thought it proper "to remark that several of the establishments are merely nominal, having never gone into operation"; the secretary of state of Vermont marked with an asterisk the manufacturing companies which were not in operation, 8 out of the total of 24 in my table, and "believed that several establishments, to which, in the list, no references are affixed, are not, at this time, in operation"; the secretary of state of New York had no documents, "showing whether any, and which, of such factories may have ceased to exist." In Connecticut, on the other hand, "A few companies that obtained acts of incorporation, but never went into operation, are omitted; some may have been discontinued . . ." No manufacturing establishments were incorporated in Maine or Rhode Island from 1800 to 1820. Slater wrote from Rhode Island, 1823, that cotton "and almost every other branch of manufacture has been carried on by joint stock companies, few of which are incorporated." The Newport Steam Factory, then in process of construction, is the only cotton factory noted as incorporated, so far as I observed. McLane Report, vol. i, pp. 927, 966.

state, but when that material fails, after the year 1820, a continuation of the table would require a special investigation. I append a continuation to the year 1832, but for two states only, and with no assurance that the figures correspond with those furnished by the secretary of state of the commonwealth for the preceding period.<sup>4</sup>

DATES OF INCORPORATION, COTTON AND WOOLEN COMPANIES

	Mass.	Conn.		Mass.	Conn.
1821 .....	9	.	1827 .....	12	1
1822 .....	9	4	1828 .....	8	7
1823 .....	9	5	1829 .....	4	3
1824 .....	6	.	1830 .....	9	1
1825 .....	13	4	1831 .....	3	4
1826 .....	7	5	1832 .....	12	5

It is scarcely necessary to emphasize the contrast in nature of the tables, giving dates of establishment and dates of incorporation. The first applies to real cotton mills, and gives only a part of them. The second table applies to projected mills, which may never have taken shape in reality, and may have manufactured something else than cotton when they were actually established. Judging by the announced objects of the mills incorporated, I should estimate a considerable majority of them to have had cotton manufacture as their primary aim, but I have not made a statistical tabulation to confirm this impression. I shall leave to some one else the detailed local investigation, which would be the only safe means to determine the question, and shall proceed

4. The dates for Massachusetts are compiled from the Private and Special Statutes, revised and published by authority, vols. v and vi, covering the years in question. I have seen nothing to make me doubt the adequacy of the figures. In Connecticut, on the other hand, for which I have used Resolves and Private Laws, 1789-1836, Hartford, 1837, pp. 723-964, Manufacturing Companies, the figures for the early years do not check with those supplied by the secretary of state, as given in the preceding table, and I suspect that other corporations were established beside those formally chartered by the legislature. New York early adopted a general act for incorporation, and the legislative records give no clue to incorporations.

on the assumption that the figures of this last table supply a satisfactory index of promoting activity not only in the textile industry in general, but also in the cotton industry in particular. If that assumption be accepted as reasonable, the close correspondence in the figures of the two tables leads immediately to a conclusion of importance, namely that the figures of the first table, incomplete as they are, still are fairly representative of the total number of factories established in different years. We get no help in solving the problem of the number of factories of relatively recent date, say after 1820, in my first table, which ought to be shifted back in time, and given a date in the earlier period. We do get, however, a fairly accurate indication of the way we should distribute dates in the earlier period both for those factories and for others which had been started, but had disappeared and were not enumerated in 1832.<sup>5</sup>

We have reached at last a point at which we may cease to criticize the figures of the first table, and may seek to analyze them, in the hope of getting constructive suggestions on the early history of the cotton industry in this country. I shall not reiterate the qualifications and reservations with which the first part of this paper was burdened, and which apply with varying force in different applications of the figures. If the conclusions are stated in positive form the reader will understand that they aim merely to formulate hypotheses, not to describe the facts of historical development.

5. Two objections occur to me which may be raised against this course of reasoning. First, the tendency to incorporation was not a constant, but doubtless grew with time; the lack of incorporations before 1807, for example, is of little significance. Secondly, the incorporations give no indication of the absolute number of new projects, because they were usual only in the case of the larger concerns. I shall not attempt to discuss the weight of these objections; they indicate the need of caution in applying the hypotheses, but do not, in my opinion, destroy their value as guides to further research.

1. The development of the cotton industry as marked by the establishment of new factories, was notably irregular. Cotton factories did not, like population, increase at a steady rate; and they did not increase at a rate steadily accelerated. Periods of rapid growth alternated with periods of relative stagnation.

2. The periods of greatest activity culminated in the years 1814 and 1828; indications that another period of expansion had begun and was still in process in 1832 are borne out by other sources.

The table does not accord with the view commonly held, of the importance of the period of commercial restriction preceding the outbreak of the War of 1812, in the initiation of our industrial development. The years 1810 and 1811 present, indeed, a marked acceleration in the establishment of new enterprises; the movement was most marked in Massachusetts, but was general in character. If we take the figures at their face value, however, we find the year 1806 *preceding* the embargo marked as the apogee of industrial expansion in the period from early times down to 1809-10; the year of the embargo, 1807, and the year following show a recession in the founding of new enterprises, and local restriction on the forward movement. And however far we may feel bound to restrict the evidential value of the figures of single years, taken separately, we cannot compare the figures by groups of years, 1807-11 and 1812-14, without acknowledging at least a very strong probability that the general establishment of the factory system in this country is to be dated from the War of 1812 rather than from the period of commercial restriction preceding it. Comparison with the second table, giving perfectly definite dates, even tho they are of very indefinite intentions, makes the probability seem to me practically a certainty. I attach some importance to the

evidence given before an English parliamentary committee<sup>6</sup> by a cotton manufacturer and merchant, who had been in business since 1792, that the American cotton manufacture had amounted to nothing worth speaking of before 1814, and had grown up since that year.

The matter requires some further discussion because my conclusion departs not only from traditional views, but also, in appearance at least, from established facts. Gallatin, in his report of 1810, counted 15 cotton mills erected before the year 1808.<sup>7</sup> By the end of the year 1809, returns had been received of 87 mills erected, of which 62 (48 worked by water, 14 by horse power), were already in operation and the remaining 25 were to be in operation before the end of 1810. Gallatin printed a detailed list, dated November, 1809, of 40 cotton mills within thirty miles of Providence, of which 23 were in Rhode Island; John K. Pitman of Providence counted, in 1810, 39 cotton factories in Rhode Island alone, and 76 within the thirty-mile radius of Providence.<sup>8</sup> Contemporary accounts agree with my tables in recognizing a very rapid expansion of the cotton industry after 1812. A petition from Rhode Island presented to the Senate, December 22, 1815, asserted that there were then 140 cotton factories within the thirty-mile radius.<sup>9</sup> But we

6. British Parliamentary Papers, 1833, vol. vi, Committee on Manufactures, Commerce and Shipping, questions 653, 688, 690.

7. American State Papers, vol. viii, Finance, vol. ii, p. 427. Samuel Batchelder, *Introduction and Early Progress of the Cotton Manufacture in the United States*, 1863, p. 51, accepted this figure with some hesitation. For a modern survey of the facts and sources see Clark's admirable *History of Manufactures*, pp. 536 ff.

8. Pitman is quoted by White, *Memoirs of Slater*, p. 258, from Benedict's *History of Rhode Island*, 1813, a book which I have not had the opportunity to use. Cf. White, p. 188, for a list of cotton mills within the thirty-mile radius, 1812, including 33 in Rhode Island and 20 in Massachusetts. I introduce these various statements merely as illustrations, and do not feel required to extend the list, much less to make a critical comparison of the statements.

9. *Annals of Congress*, 1815-16, p. 1654. Perhaps the petition is printed also in the *American State Papers*; I have not come across it there.

are left still with the problem of reconciling the large contemporary figures of factories established before 1812 with the figures, relatively insignificant, of my table.

First, we can agree that the statistics of the table, for the early years, are minima; that the inclusion of mills undated in the McLane Report, and of mills misdated by their reorganization, not by their establishment, would raise the figures. But I should suppose the effect would be about the same on years immediately before and immediately after 1812, and do not see that we appreciably reduce the contrast between the periods by this method. Nor do I see any advantage in an attack on the figures of Gallatin and other contemporary accounts; any reasonable allowance for exaggeration would leave them still hopelessly in excess of the figures of the table. We cannot deny the difference; we must accept it and explain it. This we can do, to my mind satisfactorily, if we assume that the mills established before 1812, however numerous they may have been, vanished for the most part without leaving a trace in our later industrial history. They were probably equipped with jennies, and with the crudest arrangements for the application of power, and if so they were not worth salvage when the original proprietors failed. We may grant, then, to the period of restricted commerce before 1812, the credit of many enterprises begun, but shall have to offset this with a debit of almost as many total failures. First in the period of the war do we find many enterprises begun, endowed with vitality sufficient to carry them through the bad times following. Personnel might change and ownership shift, but the factories themselves kept their places as going concerns, and were counted in 1832.

Why was the mortality of infant cotton factories

born just before 1812 so much higher than was the mortality of those born just after 1812? Protection due to the interruption of commerce seems to me a very insufficient reason. Many of the little mills which started operations in the years just before the war must have endured at least long enough to enjoy this protection and should have had a distinct advantage over similar mills founded in 1812 and the following years. I think that the mills after 1812 must have been different — better equipped, better provided with capital, started with a more vigorous impetus. It seems not unreasonable to ascribe to the war itself a psychological influence, stimulating manufacturers to bolder action, a more serious study of past experience, a more determined attitude toward the future.<sup>1</sup> The introduction of the power loom at the close of the war is generally agreed to have had a marked effect on the efficiency of the American cotton manufacture; and apparently mills founded during the war, rather than those founded before 1812, took advantage of the new instrument.

3. Factory building never stopped altogether. Every single year, even years of the deepest depression, showed new establishments. So in 1816, when "almost every textile mill in New England was closed," when the

1. The theory of the transfer of capital from maritime to industrial undertakings, is attractive; I can accept it as applied to a flow of savings, but find it hard to visualize the fluid fund of capital which seems to be involved. It is worth noting, in this connection, that of the Massachusetts banks founded before 1812 more than a dozen had been started in the maritime towns, and only three in the interior (Northampton, 1802; Worcester, 1803; Pittsfield, 1805). During the war more new charters were granted to industrial than to maritime communities. Banks were founded in Taunton, 1812; Springfield, Dedham and Lynn, 1813; Pawtucket and Haverhill, 1814. Thereafter, down to 1830, new banks founded in industrial towns were nearly as numerous as those founded in maritime towns. The number of new banks founded in the interior was especially noteworthy in certain years, 1824, 5; 1825, 5; 1827, 6; 1828, 2. Cf. Massachusetts Acts and Resolves, and Private and Special Statutes.

American cotton manufacture was "almost swept out of existence";<sup>2</sup> so in 1820, when Clark estimates that 40 per cent of American cotton spindles were idle, new factories sprang up. Factories were "born into a world already fully possessed. . . . At nature's mighty feast" there were no vacant covers for them. The indication of an irrational element in our industrial development, of a "tendency to increase" which cannot be harmonized with classical doctrines of profit and loss, is worth attention.

4. The influences affecting the ebbs and flows of factory building were general rather than local in character. If we scrutinize the figures for the three years of maximal activity, we find in 1814 all the six states there represented at the peak; in 1828 Rhode Island was the only one of seven states that was out of step; in 1831 all seven states were moving together, altho the rate of advance was more sluggish in Connecticut than in the others. There is a marked case of local divergence in one of the earliest years, 1807, but none so notable afterwards; and my own belief in the significance of the figures has been strengthened by observing their general consistency when studied both horizontally and vertically.

5. What, now, were these influences, which caused the ups and downs of factory establishments? That is a question to be discussed in a large book, not in a short article. One only I am tempted irresistibly to touch upon — the tariff. Let us disregard all refinements; let us assume the figures to be perfectly accurate and comprehensive, fixing the number of factories established in each year, and endeavor to formulate the rela-

2. Clark, *History of American Manufactures*, pp. 379, 540; cf. George S. White, *Memoir of Samuel Slater*, Philadelphia, 1836, pp. 209 ff., Nathan Appleton, *Introduction of the Power Loom*, Lowell, 1858, p. 13.

tion in which these figures appear to stand to protective tariffs enacted in 1816, 1824, 1828, and 1832.

The figures lend themselves better, as I view them, to Rabbeno's idea of industries creating a tariff than to the protectionist's idea of the tariff creating industries. The cotton factories which had sprung up before 1815 gave rise to the tariff of 1816, and then the forward movement halted for a time. It began again, without further protection, after the culmination of bad times in 1819, and the tariff of 1824 followed two years of active and general expansion. The three years following 1824 showed constancy in the total figures of new factories established, with considerable oscillations in the individual states; these figures are noncommittal. After 1828 a recession was followed by an upward swing, in process in 1832 when further protection was given; again, and for the third time, the increase in protection followed the increase in factories founded. In this artificial formulation of the problem, in which other factors are excluded, the simpler hypothesis to express the correlation of tariff and industry appears to make the tariff effect rather than cause of industrial development.

Further than this introduction to a study of the question, the figures do not take us. How can we explain the extraordinary divergence in the figures for factories established in the two years of tariff legislation, 1824 and 1828? Is the explanation technical, that is, would the divergence disappear, if the figures were refined so as to be minutely exact in date and accurate in number; or does it point to outside forces in operation? The question suffices to remind us once more, in closing, of the frailty of our data and of the complexity of the problem of economic progress.

CLIVE DAY.

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## REVIEW

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### MILLS'S STATISTICAL METHODS<sup>1</sup>

THE reviewer is tempted to be content with quoting the opinion of one of his colleagues, that "Mills's book is a scholarly piece of work from start to finish." A review, to be useful, must go into detail; but, if comment were to be summed up in a single sentence, it would take some such form as the above.

There is a logical continuity in the plan of the work. Of the two broad types of plan for a course in economic statistics — the one in which the sequence of topics follows largely the successive steps in a complete statistical analysis, and the other in which the sequence is controlled chiefly by the kind of data to be analyzed — the author has chosen the first. Following a brief introduction, he presents first the graphic method; and from that point on, he uses charting as a guide and aid in the numerical analysis. Over one hundred pages are then devoted to frequency series, their construction from raw data, their fundamental form, the determination of their averages and variabilities, and the outline of methods for measuring their other characteristics. There follows Chapter VI, of about eighty pages, on the subject of price indexes. Slightly over one hundred pages are taken up with the methods of analyzing fluctuations in time series: secular trend, seasonal variation, and the construction of business indexes. Chapters X to XIV, covering about one hundred and fifty pages, treat of the problem of correlation in all its more important aspects. The two final chapters outline the properties of the Gaussian error distribution, and develop the essentials of the theory of statistical sampling.

1. Statistical Methods, applied to Economics and Business, by Frederick Cecil Mills. New York, Henry Holt and Company, 1924. Pp. xvi, 604.

If statistical methods are taken to include only processes "of condensing, analyzing and interpreting," the outline of the text is comprehensive as well as logical. The suggestion is ventured, however, that there should be included under statistical methods, not these alone, but also the routine yet vital operations incident to the assembling, criticism, and presentation of raw statistical data. The immense practical importance of such operations in statistics is nowhere more apparent than in economic problems, for it is especially in economic applications of statistics that data are widely used as evidence in textual discussion, without their having been subjected to any other sort of analysis than organization into a table or a chart. It seems fair to urge that a course designed "for the learner" should not entirely overlook the intricate difficulties which beset the collection of statistical data, or confine discussion of the practical questions of tabular and graphic presentation — except for incidental and scattered comment — to a brief section (pages 73-74) and the Brinton rules (pages 52-59). Professor Mitchell's dictum concerning index-number practice may not apply in full to every statistical problem, but it certainly suggests that there is need for instruction on the collection of data.<sup>2</sup>

It is a question also whether the text fully lives up to its title in showing the applications of statistical methods to the problems of business. Ordinarily the statistical data of business are classified as internal and external: those which originate within the individual business enterprise from the records which it keeps of its own affairs, and those pertaining to outside enterprises or to general business conditions which have a bearing upon the problems of the individual enterprise. It is obvious that a considerable portion of external statistics, according to this definition, must consist of economic statis-

2. "To judge from the literature about index numbers, one would think that the difficult and important problems concern methods of weighting and averaging. But those who are practically concerned with the whole process of making an index number from start to finish rate this office-work lightly in comparison with the field-work of getting the original data." Bulletin 284, United States Bureau of Labor Statistics, p. 25.

tics. The external data which interest the manager of a particular enterprise are largely the same data which interest the economist because of their bearing upon general economic problems and general business conditions. To the extent therefore that a text satisfactorily applies statistical methods to economic problems, it in large measure applies those methods also to external business statistics. Presumably, however, the bulk of business statistics must come from internal records. Experience strongly suggests that the methods applicable to such data are by no means identical with those adapted to the treatment of economic or external business statistics. Naturally, the basic principles and the broad outlines of method are the same for both types of data; indeed they are the same also for statistical data of other fields, such as biology and psychology. But the technique of analysis and often also the plan of procedure vary so widely from problem to problem that generalization is difficult in the extreme. It is at least doubtful if any book which is a satisfactory text in economic statistics can also give adequate attention to the problems of business statistics.

A text on business statistics will probably take the form of a separate and entirely independent work, in which the basic plan will be a classification of the problems of business statistics according to the devices available for their analysis. Indeed, such a work, because of the great diversity of problem-types and the marked absence of general methods of attack, must almost inevitably evolve into a case-book. Moreover, in it there will be little of the mathematical symbolism — simple algebra tho it all is — which finds an appropriate place in the theoretical portions of the book under review. Emphasis will necessarily rest upon the technical processes applicable in widely varying "situations," and, more especially, upon the validity of those processes and the interpretation of the results. All of this is said, not to depreciate the practice of giving some attention to business statistics — as is done with great force and keen insight in certain parts of Professor Mills's work — in a book primarily concerned with economic problems, but to emphasize the proposition that the problem

of teaching business statistics will not be solved until a book is prepared frankly and exclusively for that purpose.

Few objections can be raised concerning the treatment of the individual topics in *Statistical Methods*, and much highly favorable comment is fully deserved. The discussions of the determination of the size of the class-interval in a frequency series (Chapter III), of the characteristics of moving averages (Chapter VII), of the limitations on the method of linear correlation (Chapter VIII), and of measures of reliability (Chapter XVI), may be cited as instances of that clarity and precision of statement which grace nearly every section. The index of correlation (Chapter XII) is an important new tool of statistical analysis, and this device, for which the science is indebted to Professor Mills, is carefully and fully described.<sup>3</sup>

The reviewer is disposed to differ as regards the introduction of the notion of index number by an illustration from the field of production rather than that of prices; with the treatment of fitting trend curves which seems to emphasize the formalism of the normal equations at the expense of a fuller and more direct use of the geometrical notion; with the use of egg prices as an illustration in expounding methods of seasonal measurement, instead of basing the discussion upon a series in which the seasonal swing is only a moderate fraction of the entire fluctuation; and with the prominence given to a problem of variation over time in illustrating the method of linear correlation. But in doing so he is perhaps passing the bounds of just criticism, for on these and many other points real differences of opinion exist among statistical specialists. It would be presumptuous indeed to suggest, in the present stage of the science of economic statistics, that one method of treatment is fundamentally wrong and a contrary method absolutely right. Perhaps all that should be said upon some of these details is that, had the reviewer written the book, several points would have been handled otherwise than they were handled by Professor Mills.

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3. The original memoir appears at page 273 of *Journal of the American Statistical Association*, September, 1924.

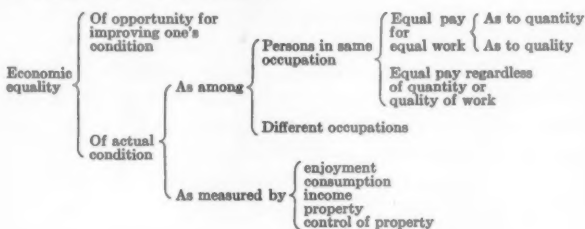
## NOTES AND DISCUSSIONS

### THE MEANING OF ECONOMIC EQUALITY

To say that two things are equal means, of course, nothing. To say that they are of equal length, breadth, thickness, cubic contents, or weight means something. Similarly, to say that men are equal means nothing until it is specified in what respects they are equal. Even economic equality does not acquire a real meaning until we agree upon some definite basis of comparison. We can, for example, choose money income as a basis of comparison, and then say that, on that basis, men are equal or unequal, as the case may be. But money income is not the only possible basis of comparison.

After having agreed upon a definite basis of comparison, such as money income, we may still compare men individually or we may compare groups of men. We may, for example, compare the economic condition of all those who follow one occupation with that of all those who follow another occupation. On this basis we may say that there is equality or inequality, as the case may be, between the two occupations.

There are so many different bases of comparison, and so many different things to compare, as to make even a tentative outline desirable as a preliminary to any comprehensive discussion of economic equality. The following is suggested as such a tentative outline.



It is not my purpose to discuss this outline comprehensively, much less to present a comprehensive treatise on economic equality, but merely to explain some of the terms used in the outline.

Equality of opportunity is, of course, quite consistent with inequality of condition. Two runners may be given an even start, and equally good tracks on which to run. This would be equality of opportunity. One might outrun the other and win a larger prize in the form either of applause or of pecuniary value. This would be inequality of condition. There are many who would apparently feel satisfied if we could achieve equality of opportunity in seeking the prizes of economic endeavor. Others desire equality of condition, or at least a much closer approximation to it than has yet been achieved.

When we come to discuss equality of economic condition, it is important to decide whether we want equality as among persons or as among occupations. It would be generally agreed, probably, that equality among occupations is more important than equality among persons in the same occupation. If, on the average, those who follow one occupation are about as prosperous as those who follow another, most of us would be satisfied even tho there were considerable differences among individuals in either occupation, provided such inequalities were based upon differences in the quantity or the quality of the work done. Equal pay for equal work, if it were achieved, would result in unequal pay for different persons.

A somewhat more important and less familiar problem arises when we consider the basis for comparing the economic conditions of different persons. Shall it be their enjoyment, their consumption, their incomes, their property, or their control over property? It is reasonably certain that in any well-ordered and prosperous country, the inequalities increase as we change our basis of comparison from enjoyment to consumption, from consumption to income, from income to ownership of property, and from ownership to control of property. Inequalities of satisfaction, under the marginal analysis, are less than inequalities of consumption. Certainly that is true if we except the very poorest classes and consider

only those who are above the line of physical want. The difference in enjoyment derived from a Ford and a Rolls Royce is by no means commensurate with the difference in the cost. In general, as expenditures increase, the amount of satisfaction increases, but at a lower rate.

In this country the differences in consumption are generally less than differences of income, even if we consider only net income after taxes are deducted. The classes with large incomes have, in the past, done most of the investing in new enterprises, and have made the largest contributions to public causes. In other words, they do not come as near to consuming their whole incomes as do the classes with smaller incomes.

It is demonstrable that differences of income are less than differences of ownership of property. Large numbers of well-to-do people, with large incomes, own no property except their clothes and household furniture. Many owners of property receive very small incomes. Again, ownership is much less concentrated than control. The shares and the bonds of a corporation may be owned by hundreds of thousands of people, but the control is necessarily concentrated in a board of directors and its officers. Millions of people hold insurance policies, and, in a sense, own the assets of the insurance companies; but the control of those assets is necessarily in the hands of a few.

Most of the startling figures regarding the awful concentration of wealth in this country relate to control, or to ownership of property. Figures as to the inequalities of income are somewhat alarming, but they do not furnish the alarmist with quite so much thunder as those that relate to ownership or control. Inequalities of consumption are seldom even mentioned, while inequalities of enjoyment could not be used to excite a crowd at a ball-game, a movie theatre, or even a political meeting. The fact that most American working men have so much actual enjoyment may explain the complacency with which they listen to speeches on the awful concentration of control of business in this country.

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THE PROGRESS OF THE FAMILY  
ALLOWANCE MOVEMENT

THE practice of paying supplementary allowances over and above the basic wage to workmen with dependents continues to grow. In an earlier article in this journal,<sup>1</sup> I chronicled the development of this system in France to the early summer of 1923, and described the structure and work of the equalization funds which had been formed to generalize the expense of the allowances and to remove any temptation for the employer to reduce his costs by discriminating against men with dependents. The number of these funds had increased by the autumn of 1924 from 120 to 159, and at the present time there are 164 such bodies which are functioning. Over 9,300 establishments, employing between 1,000,000 and 1,100,000 workmen, belong to these funds, and the annual amounts thus paid out by them in allowances approximate 128,000,000 francs. There is, moreover, a very general movement to increase the amount of the monthly grants, particularly those for the third and subsequent children, altho the allowances are still much less than the actual cost of supporting a child.

The system has by now also become virtually universal in the coal mining industry of France with its 230,000 employees. Here the allowances are paid and borne by each employer without any equalization of costs through a clearing fund. They nevertheless amounted to 80,000,000 francs during 1923, and formed approximately 5 per cent of the payroll, or virtually double the proportion which they formed of the firms within the system of equalization funds. During the past year the French government has increased the scale of its annual allowances to civil servants from 330 to 495 francs for the first two children, and from 480 to 840 francs for each child beginning with the third. While official statistics are wanting, it seems probable that there are at least

1. *Family Allowances and Clearing Funds in France*, vol. xxxvii, pp. 643-686.

one million persons who come under the government provisions, including as they do the teachers, and that the total yearly amount thus disbursed is probably not less than 400,000,000 francs. All the parties have agreed to a clause in the 1925 budget which increases the allowances to 540 francs for the first child, 720 francs for the second, 1,080 for the third and 1,260 for the fourth and subsequent children.

When to these groups are added (1) the railway workers, who number approximately 400,000 and who are also under the family allowance system, and (2) the employees in many private concerns who are paid allowances but whose employers do not belong to any equalization fund, the total number of workmen employed by concerns paying allowances amounts to nearly 3,000,000, while the total amount annually distributed in allowances is now somewhere between 750,000,000 and 900,000,000 francs. The French unions have, moreover, virtually ceased their opposition to the plan, and in increasing numbers are indorsing the general principle. They are, indeed, insisting that it shall at least be made a legal obligation upon the employers and not a matter for their voluntary assumption or rejection.

While France has perhaps the most maturely developed system of family allowances, the method is widely followed in the other countries of Continental Europe, as is shown in a recent Bulletin on the subject published by the International Labour Office <sup>2</sup> which has resulted from coöperative research undertaken by that body and the University of Chicago. It is almost universally applied in the case of public employees in Belgium, Holland, Germany, Sweden, Austria, Switzerland, Finland, Poland, and Jugoslavia, and with some qualifications in Czechoslovakia. It is, moreover, gaining ground, on the whole, in private industry. Thus in Belgium there are now eleven equalization funds, which include 576 firms and 122,000 employees. The entire mining industry has in addition adopted the plan, swelling the total number in private

2. Family Allowances — The Remuneration of Labour According to Need. Studies and Reports (Series D, No. 13) — International Labour Office, 1924, 184 pp.

employment to an estimated figure of 280,000 workers. The Socialistic trade unions in Belgium favor the basic principle of the plan, altho like their French confreres they want to have the granting of the allowances either made compulsory upon the employers or transferred to the state and paid out of the public revenues. Within the last year, the Catholic trade unions have taken the unique step of organizing an equalization fund which will pay annual family allowances to members, of 500 francs per child for all children under sixteen years of age beyond the first two, together with a birth bonus of 200 francs for each child. Each Catholic trade union or affiliated society pays into the fund in turn an annual assessment of 275 francs for each member.

There are three primary differences between the way family allowances have developed in Germany and their evolution in France. In the first place, they have been primarily instituted through collective agreements between the trade unions and the employers' associations, while in France the initiative has been entirely with the employers. Secondly, in sharp contrast to France, few equalization funds have been established and the allowances are, in the main, paid directly by the employer. Despite this general tendency, however, two of the German clearing funds are very large, that of the Berlin metal industry, including 239,000 workers, being the largest in the world, while the Elberfeld fund covers approximately 40,000 employees. Finally, the German allowances very frequently include grants for the wife as well as for the children, and in some cases the only subsidies granted are for the wives. The provision of some form of allowances is practically universal on the railways, and it has been widely adopted in the mining, metal, banking, chemical, textile, pulp, paper, and cellulose industries. Such allowances are also applied in approximately half of the establishments in the printing, mercantile, and glass, stone, and pottery industries.

At the time when the food subsidies were abolished in Austria, the payment of family allowances was made obligatory upon the employers of that country, and district equalization funds were organized. Contrary to the purpose of the law,

however, the amounts of these allowances were not increased with the increase of prices, and the depreciation of the Austrian currency rendered them grossly inadequate. A number of industries, however, provide for allowances in their collective agreements with the unions, as is notably the case in the coal and lignite mines and the chemical industries. The chemical workers in the Vienna factories are in general granted such allowances.

Family allowances are also paid in the Netherlands to approximately 60,000 workers and have developed appreciably in Upper Silesia. They have, however, been losing ground since the war in the Scandinavian countries and in Switzerland.

The movement in Australia has been marking time during the last year. The labor parties in two of the states have pledged themselves to grant allowances from the public funds to families with several children to support. They are now dominant in the various state parliaments, but seem reluctant to pass such measures because of the expense which they would entail. Thus the Premier of Victoria, Mr. Prendergast, is now intimating that such allowances are properly matters for the Federal government to handle. There, it should be noted, the Labor Party is not in power. More recently the Interstate Conference of labor parties refused to approve a resolution pledging the party to a grant of five shillings per week for each child until it leaves school. The Labor Party will, in any event, resist any attempt to make the single man or the family of two the standard in fixing the basic wage, and will try to continue the present standard of a family of five, or, as in New South Wales, of four.

Little application of the system has been made in England save in the case of the army, the coal miners of southern Wales and Monmouthshire, and the Wesleyan ministers. There has been, however, a great deal of discussion of the principle, largely stimulated by Miss Eleanor Rathbone,<sup>3</sup> an

3. For a description of the English discussion up to the publication of Miss Rathbone's *The Disinherited Family*, see my article, "The British Discussion of Family Endowment," *Journal of Social Forces*, vol. iii, pp.

advocate for the last nine years of the state endowment of motherhood. A Committee which she formed in 1917 published a brochure on *Equal Pay and the Family*, which advocated state grants to families with children along the lines of the war-time separation allowances. Because of the expense, these allowances were to be terminated when the children reached the age of five. The Committee also advocated allowances for mothers, which were also to be discontinued when the children were ready for school. Such a plan would manifestly have deprived a family of assistance at the very time when it was most needed.

Through Miss Rathbone's efforts a Family Endowment Council has been formed, which is actively popularizing the idea.<sup>4</sup> And by far the most important development in the British movement thus far has been the publication during the last year of Miss Rathbone's excellent book on *The Disinherited Family*.<sup>5</sup>

Miss Rathbone's primary reasons for advocating the cause of family endowment are two: first, in order that the children in the families of the poor may be ensured of a minimum; and second, as a feminist, in order that women in industry may receive equal minimum wages with men, and mothers of families be assured of an independent source of income. The family allowance system, she believes, is the only effective means of attaining both of these aims. By an analysis of the national income of Great Britain, as estimated by Bowley and Stamp, she shows that it would have been financially impos-

118-124. For other English proposals, see E. M. and Dennis Milner, *Scheme for a State Bonus*; Bertram Pickard, *A Reasonable Revolution*; M. D. Stocks, *The Meaning of Family Endowment*. Beatrice Webb proposed a similar system of state allowances in her minority report of the War Cabinet Committee on Women in Industry, 1919, Cmd. 135; later reprinted by the Fabian Society under the title *The Wages of Women and Men, Should They be Equal?* B. Seeböhm Rowntree, in his *Human Needs of Labour*, favored paying all adult males enough to maintain a family of five, but advocated the granting of state allowances for families which were larger than this size.

4. See their *Monthly Notes* (50 Romney Street, London, S. W. 1).

5. Published in England by Edward Arnold and Co., and in the United States by Longmans, Green and Co., 324 pp.

sible to have paid all adult male workers enough to support a family of five. She shows, moreover, that the typical wage-earner does not have a family of five dependent upon him, thus corroborating other studies,<sup>6</sup> which have recently been made. She points out that to pay all the male workers on the assumption that they had such dependents, would result in providing for "three million phantom wives and for over sixteen million phantom children in the families containing less than three children, while on the other hand, in families containing more than three children, those in excess of that number, over one and three fourths millions in all, would still remain unprovided for."

The book cannot fail to arouse further interest in the project. The close student, however, will regret the failure to pronounce more definitely on the relative merits of state allowances as opposed to grants by industry. If the former method is used, what would be its probable effect upon wages? It would seem almost undeniable that such allowances, added to existing family incomes, would lead to a considerable reduction of the basic wage-level. The men who were granted these additional sums would not object strenuously to the employers' cutting their wages, and thus the remuneration of the single man would probably be reduced. The reduction, however, would probably not be so great as to take away all the gains resulting from the grants. Miss Rathbone's treatment of this point is not as definite and as clear-cut as one might wish it.

If the system is to be administered by industry, as on the Continent of Europe, a number of interesting problems present themselves, of which perhaps the most important are the relative merits of industrial as opposed to regional funds; whether the allowances should be paid during short-time and unemployment; the best method of assessing the employers; and how the fund should be administered. Miss Rathbone is,

6. See Paul H. Douglas, "Is the Family of Five Typical?" *Journal of the American Statistical Association* (September, 1924), vol. xix, pp. 314-328.

perhaps, wise in not raising these issues in a work designed primarily to arouse public interest in the general principle, but they must be thought through if the plan is to realize its maximum usefulness.

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### "SUPEREST AGER"

In recent years, H. J. Nieboer, in *Slavery as an Industrial System*, 1900, 1910, B. Malinowski, in *The Family among the Australian Aborigines*, 1913, F. Oppenheimer, in *The State*, 1914, 1922, and, most recently, L. T. Hobson, in *Social Development*, 1924, have attempted to reinforce the supports of their several theses concerning economic origins by appeal to a supposed existence of free land in the early stages of human, social and economic development. An appeal, in other words, to the supposition — referred to as if it were an established fact of economic history — that, in primitive hunting and agricultural societies, the population of any given area is always less than that area could support even in the existing aboriginal state of the arts. The consequence is supposed to be that land is not appropriated politically, slavery and social classes cannot arise, and every individual and group is always faced with an abundance of utilizable, unappropriated or "free" land. All these writers, curiously enough, refer to Tacitus's observation made in early Germany, and use his Latin expression to supplement their English. Thus, Nieboer (p. 390), says of "most agricultural tribes": "among them, *superest ager*, as Tacitus says of the ancient Germans." And Hobson: "After all, the dominant fact in the lower grades [of culture] is, that there is plenty of land, — *superest ager*" (pp. 285-288).

We have here an old, fallacious assumption, injected as a main support of theses concerning matters of great import in economic history — the evolution of property in land, of hu-

man servitude, and so on. I shall point out the fallacy of the assumption, and something of the reason for its origin and persistence.

A consideration of the nature of population growth (elucidated by Malthus) should have prevented the continuance of the fallacy. It is of the nature of population to increase beyond the possibility of being sustained by the food supply obtainable through the use of the existing arts of production. As population presses upon the means of existence, war, disease, famine, birth control, and infanticide check its further growth.

Now there is nothing in the facts of primitive life which would indicate that any tendency or situation other than this has normally obtained in the early stages of human development, as well as among animals and among civilized men. Infanticide, economically motivated, was apparently universal; so also famine, war, chronic uncertainty of subsistence among the weaker elements in any given population, and an exhaustive, labor-consuming utilization of the resources of the land. There is no reason to believe that among primitive groups war, voluntary abortion and infanticide, and the like, normally kept population below the point where the Malthusian checks were socially indispensable, or where all land — the existing state of the arts considered — was not exhaustively utilized.

Of course, from the point of view of Tacitus, there was "plenty of land" in Germany. With Roman agricultural methods, German land would and did support a vastly increased population. But this is very different from maintaining that in ancient Germany there was no pressure of population on the landed resources, with whatever social effect such an economic fact would have.

Modern writers apparently have not only failed adequately to take account of the limitations of primitive agriculture and primitive hunting technique, but have also failed to take into account the fact that, so far as population and the arts go, a region may present aboriginal conditions and yet, by reason of the introduction of new diseases and new vices, represent

other than the normal, aboriginal relation between resources and population. Alcohol, measles, smallpox, and venereal diseases, introduced by Europeans, travelled somewhat in advance of the frontier of settlement in the Americas, Australia, and Polynesia. They not only had the effect of bringing the aboriginal populations to the verge of extermination, but so spread sterility and involuntary abortion, as the result of endemic venereal disease, that the native populations, before the frontier of settlement finally finished them, could not recoup their losses, even with the discontinuance of voluntary abortion and infanticide.<sup>1</sup> Naturally, under such abnormal (because, in the long run, temporary) conditions, here and there, there will appear to be primitive communities living amidst "plenty of land" in a very absolute sense. Such abnormal conditions account for the breakdown in primitive property in land among some aboriginal groups — a deterioration in culture which Hobson and several of his recent predecessors have taken to be normal, and representative of primitive or early economic life.<sup>2</sup>

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### A PROPOSAL THAT THE COAL INDUSTRY BE LET ALONE

In the February number of this Journal, Professor John E. Orchard of Columbia University outlines "A Proposal for Regulation of the Coal Industry." The article reveals a measure of familiarity with the findings of the Coal Commission, but

1. See, for example, pp. 497, n. 3, and 499, n. 9, of my article on "Matrilineal Chiefship," *American Anthropologist*, 1923.

2. Some of the errors of fact made by late writers in the matter of primitive property in land I have pointed out in *The Origins of the State*, Philadelphia, 1924; and in "Debtor and Chattel Slavery in Aboriginal North America," *American Anthropologist*, 1925 (in press).

it shows a lack of information concerning what has happened since those fact-finding days. This lack of information can be illustrated by citing the following statement from the article. "The railroads, because they have not expanded their facilities in recent years as rapidly as mine capacity has increased, are unable to handle the peak of the coal production as effectively as in the past." Facts do not bear this out. The gigantic railroad equipment program which has been in progress for several years has placed the carriers in a position to do exactly what Professor Orchard states that they are unable to do. It is true that, in 1923, when bituminous production, partly on account of the anthracite strike, averaged more than 10,800,000 tons a week for the entire year and in 23 weeks exceeded 11,000,000 tons a week, some car shortage did develop. But in 1924, when the movement of bituminous coal for the first nine weeks of the year showed a weekly average of nearly 11,400,000 tons, and for 12 consecutive weeks near the end of the year an average of more than 10,500,000 tons, the effect of the equipment program of the railroads was to be seen in almost absolute freedom from car shortage. Better still, in January, 1925, when bituminous production broke all monthly records, save two, since 1920, rising to a weekly average of 11,500,000 tons, with one week in excess of 12,000,000 tons, there was but the faintest trace of car shortage, altho that month falls in the very worst season of the year for transportation troubles.

In his introductory statement, dealing with "striking weaknesses" of the industry, Professor Orchard recognizes that over-expansion is a basic evil, to which irregular operation of the mines and irregularity of output are largely due. Attributing "the more regular operation in Europe to the relation of coal consumption to total coal reserves," and declaring that here, "the whole vicious circle rests on our enormous wealth of coal," it is no wonder that he does not venture a specific remedy for the ills of the industry, but rather leaves recommendation along that line to the proposed coal parliament, with its subsidiary coal institute. He states, "to hasten the reduction of capacity, some method of closing the surplus

mines should be devised." On the heels of these words, he asks, "but what are the surplus mines?" and wisely leaves the answer to the proposed parliament.

Now as to this plan for a parliament. The author avers that the movement should come, not from the government, but "from those most closely connected with coal." In suggesting the personnel of the organization, he names representatives of the United Mine Workers of America, but makes no reference to representatives from the workers not affiliated with that organization. It is natural that this omission of the unorganized field should be glaringly conspicuous to the executive of an association whose membership comprises operators from both union and non-union fields. Later, Professor Orchard supports his suggestion by this sweeping assertion: "Since organization of labor is essential to the success of the parliament, it seems evident that the open shop is not compatible with the proposal." These words are quoted, not to raise controversy concerning the merits of organized labor, but to inquire whether it can be possible that the proposal for a parliament has been seriously advanced, when its author states that an essential factor is the practical elimination of the open shop in the coal-mining industry.

In the discussion of the organization of bituminous operators through the National Coal Association, we can agree with Professor Orchard that the attitude of the government has not been conducive to organization. To go a step further, there is no immediate prospect of such complete organization among the several thousand operators of the country as Professor Orchard feels is necessary to ensure the success of his project. It may be remarked that the collection and dissemination of statistical data on coal, which are suggested as lines of endeavor for the coal institute, constitute a part of the daily program of the Bureau of Coal Economics of the National Coal Association. But in general this Association is, in a measure, marking time in its statistical activities, on account of the legal uncertainty that exists concerning proper trade-association functions. It is to be hoped that, when decisions are handed down in several trade association cases now be-

fore the United States Supreme Court, this situation will be clarified.

Professor Orchard acknowledges that the "American coal industry cannot benefit to any great extent from the experience and success of Germany and Great Britain." In view of that acknowledgment, it is probably unnecessary to stress such a contrast as that between the compact coal area of Germany with three main producing fields and the far-flung producing territory of this country, represented by more than fifty separate fields in nearly thirty states. Realization of industrial peace in the men's clothing industry through an agreement between manufacturers and needle-workers, who are confined to a few of the principal cities of the country, is cited as a reason for a coal parliament which is to be composed of representatives of several thousand operators, 700,000 miners, the iron and steel industry, an organization of smaller consumers, the wholesalers' association and others.

To furnish a constructive note to these paragraphs, mention of the well-known law of supply and demand is not amiss. This law spares few branches of business, and the bituminous coal industry is not one of the favored class. There is nothing exceptional about the industry. Its lack of stability is common to the many industries which are in a similar predicament, notably the iron and steel industry. Study of the production charts of the steel and coal industries is interesting as indicative of the reflex action of the former upon the latter. The ups and downs of the coal industry have been brought to the attention of the public in a graphic manner by charts of economists. The black diamond and the so-called dancing dollar have been favorite subjects for discourses and dissertations on the crying need for stabilization.

As far back as the records of the government extend, over forty years, the American people, with the exception of one period of two months, have bought coal at a lower price than was enjoyed by any other coal-consuming people in the world. They have been most fortunate in respect to price; and it is not conceivable that the project for a parliament contemplates a lower price. Governmental and quasi-governmental

commissions always have a tendency toward higher prices. The operators and miners, however, have a different story to tell about the working of this well-known law of supply and demand. It has frequently been brutal to both employers and employees.

The single request of the bituminous industry is to be let alone. There is cause for congratulation by the American public that within the ranks of the industry are constructive minds, who, with their investment at stake, are working intelligently and diligently along sound economic lines with the welfare of the entire industry and of the public as their objectives. This constructive work within the industry has furnished this nation with the cheapest coal in the world, on which world-supremacy in industry has been established. It is this work which is bringing about recovery, reflected to-day in many fields and accelerated by the gradual elimination of oil as a factor in the industrial fuel market. Excessive over-development caused by the abnormal demands of war has been a difficult hurdle in the path of progress. Have faith in the men who have their all in the balance, and do not invite additional hurdles in the form of well-meaning but economically unsound programs, or the dreams of the unattainable.

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### SOLDIER LAND SETTLEMENT IN CANADA

IN order to understand the significance of the Soldier Settlement Acts of 1917 and 1919 and to realize the wide difference between pre-war colonization and that inaugurated by this legislation, a brief review of the salient features of land-settlement practice in Canada at the time of the formation of the Soldier Settlement Board in February, 1918, is necessary.

The provinces which originally entered Confederation (Nova Scotia, New Brunswick, Prince Edward Island, Que-

bec, Ontario, and British Columbia) owned their Crown Lands themselves and retained control of them after confederation. Crown lands west of the Great Lakes, from which at a later date the three prairie provinces (Manitoba, Saskatchewan, and Alberta) were formed, came under the control of the Dominion Government after certain rights of the old Hudson's Bay Company had been dealt with. The Federal authorities still retained control of these Crown Lands after the new provinces were formed, paying them a cash subsidy in lieu of control of the Crown Lands within their borders.

Thus in 1918 we had in Canada three provinces (the prairie ones) whose Crown Lands were controlled by the Dominion Government at Ottawa, while the six older provinces of the Dominion themselves owned and controlled the Crown Lands within their borders.

Men with adequate capital to start farming on their own responsibility had the choice of either purchasing a developed farm in a settled district and replacing existing owners, or improving and bringing into production raw land in one or other of the provinces. The choice for men with limited capital and experience was necessarily narrower. The best, and in fact almost the only opening for most of them carrying with it the possibilities of farm-ownership, was a start on Dominion or provincially owned Crown Lands. In the provinces east of the Great Lakes and in British Columbia almost all such lands were either covered with timber of various kinds, logged-off lands, or swamp lands capable, comparatively speaking, of only slow development. On the prairies, good Crown Lands were still to be found which could be fairly rapidly developed. Their extent in 1918 was much less than was generally thought to be the case, and the best of them were distant from transportation. In order to make rural openings as widely available as possible, Dominion and Provincial governments made settlement conditions with respect to these lands easy. The various Provincial governments concerned sold their Crown Lands for nominal sums and on easy terms. In the majority of cases the granting of title depended on the completing of definite conditions both

of residence and of development, in addition to the payments just mentioned. The Dominion Government made a free grant of 160 acres to homesteaders, under conditions which called for six months' residence each year for three years, and the completing of certain comparatively easy development duties. In all cases the responsibility for the choice of his land was the settler's own; the governments concerned largely confined their attention to seeing that the development and other conditions required were completed before the colonist received title to his land.

Legislation was on the statutes of some of the provinces (for example, Nova Scotia and New Brunswick), which enabled their governments to give financial assistance in connection with the resettlement of developed or partially developed holdings. In British Columbia legislation was in force under which a given district could be proclaimed a closer settlement area, and unoccupied and undeveloped lands could be acquired for settlement purposes at a valuation, and sold on receipt of a small cash payment on easy terms to *bona-fide* settlers. Appropriations available for the above purposes, however, were, comparatively speaking, small. Both Ontario and Quebec were slowly developing their bush-land areas.

The building of the Canadian Pacific Railway, which was completed to the Pacific coast in 1885, inaugurated a new colonization period for Canada. Her settlement activities in the early days had taken place in districts which, tho widely scattered, had the common characteristics of a heavy timber cover, making the development of an agricultural holding the work of a lifetime. The long period which necessarily elapsed between settlement and the full development of the holding was not an unmixed evil, as it tended to make farmers home-makers first of all. With the opening up of the great prairies a change came over the whole character of her settlement activities. Instead of a lifetime's work, a couple of years often sufficed for the settler, with the aid of modern machinery, to break up his whole holding and bring it under cultivation. The lure of free lands, easily developed, provided a great stimulus, and large areas were rapidly settled. The development

of the timbered lands in the older provinces slowed down, and for a long period the prairie provinces saw most of our rural expansion. The aim of many newcomers was to take advantage of rising prices and boom days. Instead of the good stockmen of the older provinces a generation of straight grain farmers appeared. Settlement too often had a speculative rather than a homemaking tendency.

Large areas were surveyed and thrown open year after year. Settlement was not closed in compactly, but was scattered over vast districts. Much land which passed from the hands of the Crown remained undeveloped. In many districts, largely because of the scattered nature of settlement, production was not sufficiently heavy to make them, within a reasonable period after settlement, able to take care of the overhead expenses entailed by the building of roads, schools, churches, and hospitals with anything like the readiness a more compact settlement would have made possible. Railways also found it difficult in certain areas to obtain a paying quantity of freight and traffic.

As a result of the efforts of governments and railways to bring transportation facilities and some of the amenities of civilization to these scattered settlements, Canada found herself with more miles of railway per head of population than any other country in the world. In addition, scattered over wide areas, was a growth of roads, schools, churches, which, tho often primitive in form, needed a larger population to support and to develop it properly.

During this period large numbers of immigrants arrived each year (this was particularly true of the pre-war days of this century). Wages earned on railway development work and in the numerous other activities started by the large investments made in the West by Eastern Canadian, American, and European capital, enabled the newcomer to gather together the funds needed to develop his free holding and bridge the gap between settlement on the land and production, even tho he had but little capital of his own. Without the aid mentioned above, Western development would have been greatly retarded.

The outbreak of war in 1914 curtailed the flow of outside capital, and railway and other development work slowed down materially. As the war progressed capital became less and less fluid, and Western Canada rapidly reached the position of having to depend much less on outside sources financing her development.

The Soldier Settlement Act of 1917, under which the Soldier Settlement Board's operations commenced, provided for a loan of \$2500 to aid returning soldiers in acquiring and equipping farms of their own. It was framed largely with a view to using the Crown Lands which the Dominion Government held in Western Canada, to establish on the land such soldiers as might desire to take up agriculture for a living after their discharge. During 1918 settlement work was begun; and, in addition, a thoro survey was made of the Crown Lands that the Dominion still owned. It was found that while the remaining acreage was large, it was the residue of a much larger area which had been carefully picked over and comparatively little of it was suitable for immediate settlement. The best free lands left were distant from transportation, and were for the most part situated either in the grove belt where poplar groves are interspersed by open spaces or under a northern forest cover and not on the prairie proper. Millions of acres of good lands were still available in settled Western districts and near railways; they were owned by corporations and private individuals, however. They had passed out of the hands of the Crown.

A new period had again been reached in Canada's rural growth. Her most pressing problems were no longer those of expansion, but were those of consolidation. This was true not only of the West, but in a less degree of the East also. Consolidation involved the purchase and development of unoccupied lands in existing settlements, and did not afford the same ready openings as those available at the beginning of the century for men with little or no capital. As most of the productive Crown Lands concerned were in wooded areas the older provinces of the Dominion also claimed that opportunity should be given for their sons on returning to

settle near their own homes should they so desire. This also involved the purchase of lands.

As a result the Soldier Settlement Act of 1919 was framed to enable returning soldiers, within certain limitations, to settle in any part of Canada where conditions of soil, climate, social development, and transportation, provided suitable openings. Under this legislation the Settlement Board was enabled to grant loans to establish on the land qualified soldier settlers who had sufficient capital to make a cash payment of 10 per cent of the purchase price of their farm, and to maintain their families till returns came in from the land.

The classes of assistance contemplated for qualified settlers and the amounts are as follows: —

- (1) To aid in settlement on lands purchased through the Board.
  - (a) Up to \$4500 for the purchase of land,
  - (b) Up to \$2000 for the purchase of livestock, implements, and other equipment,
  - (c) Up to \$1000 for the erection of buildings and other permanent improvements.
- (2) To aid in becoming established on Dominion Lands in Western provinces.
  - (a) Up to \$3000 for the purchase of livestock and equipment and the erection of permanent improvements. The governing factor in these advances to be the qualifications of the settler and the class of his holding.
- (3) To aid in becoming re-established on land already owned by them.
  - (a) Up to \$3500 for the removal of encumbrances, the amount so advanced not to exceed 50 per cent of the appraised value of the land,
  - (b) Up to \$2000 for the purchase of livestock, implements, and other equipment,
  - (c) Up to \$1000 for the erection of buildings or other permanent improvements.

The total indebtedness under Class 3 was not to exceed \$5000.

At first, stock and equipment loans were short-term loans. Experience showed that this practice made the payments in the early years of settlement too heavy, and all loans were amortized, and repayment spread over twenty-five years with interest at 5 per cent per annum.

The broad outline of policy which was to govern these advances may be briefly stated as follows: (1) To settle on the land soldiers whose best interests would be served by engaging in farming. (2) To assist settlement only where the land concerned is well located, of reasonable price, and of such fertility as to ensure profitable returns. (3) To develop and close in settlement in areas contiguous to existing lines of railway. (4) To secure by means of special purchasing arrangements the best values possible in livestock, implements, building material, and other necessary equipment. (5) To guide and assist settlers in their farming activities. (6) To help the inexperienced or city-bred wife in the development of her home and its economic and social relations. This outline of policy may be summed up in the dictum, "Select with discernment, plant with discretion, tend with care."

The grant of assistance of the scope and nature authorized by the Soldier Settlement legislation was entirely new in Canada, and an entirely new organization had to be quickly built to take care of the homecoming soldiers desiring to take advantage of the provisions of the act.

As it was impossible to centralize efficiently the administration of a Dominion-wide scheme for land settlement, the Board, while controlling policy and checking administration through Head Office and Head Office officials, divided the Dominion into fourteen districts for administration purposes. Each of these districts was placed in charge of a superintendent, with wide administrative responsibilities. With the aid of his office and field staff he was responsible for the Board's operations in his district. To assist him Qualification and Loan Advisory Committees were formed.

Each Qualification Committee included a technical agriculturalist, generally drawn from either the Provincial Department of Agriculture or the staff of an agricultural college;

one or more successful farmers; a member of the District Loan Advisory Board; the superintendent himself or a delegated member of his staff.

The Committee went into the military, physical and agricultural qualifications of the applicant and placed him in one of three classes, — (1) fit and ready for immediate settlement; (2) likely to make a successful settler but needing further training; (3) definitely unfit. They recommended those placed in class 2 to obtain employment with a capable farmer, and to submit their applications again at a later period.

After qualification, the prospective settler was instructed to select the land on which he desired to be established, and if it had to be bought, to ascertain the lowest purchase price and submit his application for assistance to the nearest office of the Board, at the same time stating the class of farming he intended to carry on. An appraiser was then sent to examine the land and report on its fertility and general suitability, to classify and describe it, and give his opinion as to its cash value.

The Loan Advisory Committee's personnel was generally drawn from among the district or provincial managers of the various trust and loan companies handling farm-land loans. Together with the District Superintendent, they recommended whether or not financial assistance should be given a settler in connection with his establishment, whether on privately owned land or Crown Land. They also dealt with the advisability of purchasing specific parcels for individual settlers, and their price, basing their decisions on the report of the Qualification Committee, the settler's application, the appraiser's report on the land in question, and their own personal knowledge of land values in the district.

The Board's field staff, to the number of some 150 men, was distributed at central points in agricultural districts throughout the Dominion. They were generally ex-soldiers, and were practical farmers with first-hand knowledge of the district's requirements. Some 50 per cent of them were graduates of one or other of our agricultural colleges. They visited settlers periodically, with a view to assisting them to handle

their farms in the most profitable manner. Naturally enough, the greater part of their time was devoted to the weaker settlers.

The Home Branch staff endeavored, by personal visits and by organizing short courses at central points, to enable the settler's wife to handle her home more easily and effectively and to aid in her husband's success.

Up to December 31, 1924, the Board has established some 30,604 soldiers on the land; of this total 24,148 have been granted financial assistance. The balance have acquired Crown Lands under Soldier Settlement legislation, but have received no loans. The total acreage occupied is 5,768,879 acres. Of the 24,148 settlers who have received loans, 4229 are on free Dominion Lands; 2463 are on privately owned lands; 17,456 are on purchased lands.

The advances made amount to \$103,150,000. The average loan per settler is \$4266.

At the same date livestock had been purchased for settlers, after inspection by the Board's field staff, as follows: 56,081 horses; 58,834 cows; 31,616 other cattle; 10,865 sheep; 14,641 swine; 285,978 poultry.

Settlement is Dominion-wide, and while a large majority are mixed farmers, it includes fruit, truck, poultry and grain farmers. Our field staff is endeavoring, wherever possible, so to shape the operations of specialists that their living is not dependent on their special line of farming, but on other lines, as insurance against bad years.

The very nature of the scheme itself involved the waiving in many ways of ordinary business margins of security. In the early rush it was impossible always to avoid settlement of unsuitable men; many of them have already disappeared from the scheme, others have yet to go. The last few years have been very difficult farming years in Canada, and particularly difficult for our settlers. While prices of agricultural produce were high during the first years after the war, by the time the average soldier settler was beginning to get into his stride, prices broke badly with post-war deflation and the Fordney tariff in 1921, and very trying days occurred.

To aid in tiding over to better times, the Dominion Government waived interest charges in 1922 for periods up to a maximum of four years.

The total number of salvage cases from all causes, to the 31st of December, 1924, is 5203 or 21.5 per cent of the total number of settlers with loans. These abandonments include cases arising from death and recurrence of a war disability, as well as those due to unsuitable men and unsuitable land. At that date some 1863 parcels of land had been resold, mainly to civilians, the price realized being \$675,398.93 more than the Board's investment in the land. By the same date 727 settlers had repaid their loans in full.

On March 21, 1925, payments had been received amounting to \$2,357,915.98, or 61.2 per cent of the total collections called for during the current collection year. By the close of the season it is expected that over 70 per cent will have been received. About a third of the settlers are now soundly on their feet, and need no supervision; a further third are making a living, progress, and some payments each year, but are not yet able to meet their payments in full. The rest are struggling along, but will have to show more progress than heretofore if they are to succeed. As many settlers took up or bought raw-land farms and it takes some years to bring such a farm to full production, returns will be better as the years pass by. Each of the past five years has seen increasing amounts repaid the Dominion by soldier settlers. As a general rule, they have to shoulder a much heavier burden than that of the average farmer, having commenced operations at a time when prices were at their peak, and being required, while farming through difficult years without reserve of capital, not only to earn a living, but also to make their farms carry and redeem their total purchase price. In the main their performance has been a very creditable one. They have proved that it is not necessary to come from any particular district or to have been born on a farm, to make a success of farming. Many of the outstanding successes among soldier settlers are being achieved by men who, prior to the war, spent most of their life in industrial and non-rural pur-

suits. Englishmen and Scots have been as successful as native-born Canadians. Time and again it has been demonstrated that while good land, good stock, and good farming methods are great factors in success, the factor of prime importance is, after all, the character of the individual settler.

During the initial years it was difficult to keep down administration costs; for some years past (if the cost of the special supervision services not furnished by any company doing a regular loan business is deducted), administration costs have approximated those of the ordinary loan company.

In 1923 the Dominion Government transferred the Board to the Department of Immigration and Colonization, to become its Land Settlement Branch, thus widening the scope of the work to include direction and advice to civilian settlement as well as its original duties of administering the Soldier Settlement Act.

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#### CONSUMERS' SURPLUS IN INTERNATIONAL TRADE. A SUPPLEMENTARY NOTE

IN a note on "Marshall on Consumers' Surplus in International Trade," printed in this *Journal* for November 1924 (p. 144), I discussed what appears to have been an arithmetical slip on Marshall's part (*Money, Credit, and Commerce*, pp. 161-163). The slip affected the inferences Marshall drew from some hypothetical figures illustrating the terms on which two countries would be willing to exchange their respective products.

Since that note appeared my attention has been called to a review of Marshall's book by Professor Achille Loria, in *La Riforma Sociale*, May-June, 1923 (vol. xxxiv, p. 234). The error which prompted my note did not escape Professor Loria's notice. Furthermore, Loria corrected Marshall's figures for the net benefit accruing to one of the two countries, and his result was precisely what I reached.

Whether the notion of consumers' surplus has any real bearing upon the problem of the amount of benefit derived from international trade is a question with which the distinguished Italian economist did not concern himself. He suggested, however, that Marshall assumes that each country is always willing to give more of its own goods for more of the other country's goods, that is, that demand, in a special sense, is elastic. But, Professor Loria asks, what if demand should be inelastic, so that an increase of exports would diminish imports? Under such conditions, he concludes, each country, if it had the matter in its own hands, would stop short at the point at which further exports would begin to diminish its imports. Since the other country's interests will have to be reckoned with, however, the equilibrium point will be intermediate between the two points thus separately determined.

Loria referred his difficulties to Marshall, and prints the latter's reply. Nothing in the reply throws any light upon the matter of the arithmetical slip. As regards the other point, Marshall explained that he was dealing with competitive, not with monopolistic, trade. This was clearly the appropriate answer. Loria, like Jevons, had viewed each country as a "trading body," consciously conducting its trade so as to maximize its own advantage. There are further difficulties, I believe, in Professor Loria's position,<sup>1</sup> but I shall not discuss them here. The purpose of this note is to make record of his priority in respect of the matter with which my earlier note dealt.

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1. The positions of equilibrium of international trade under inelastic demand were, in fact, analyzed (in my opinion, accurately analyzed) by Marshall. Cf. *Money, Credit, and Commerce*, Appendix J, 9.

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